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Oil Spill Dispersants Product Data

Edison Water Quality Lab, N J

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The purpose of this manual is to furnish a ready access to currently available oil spill dispersant information. The manual summarizes oil spill dispersant product data available to the Oil Pollution Research Section staff at the time of preparation. As such, it comprises data summarized from the library, reprint, product and administrative files at the Edison Water Quality Laboratory. This report contains reference to some preliminary unpublished toxicity data.

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FOREWORD

The purpose of this manual is to furnish a ready access to currently available oil spill dispersant information. It was specifically prepared for the Division of Oil and Hazardous Materials, which expressed a need for such a compilation.

The manual summarizes oil spill dispersant product data available to the Oil Pollution Research Section staff at the time of preparation. As such, it comprises data summarized from the library, reprint, product and administrative files of the Edison Water Quality Laboratory.

This report contains reference to some preliminary unpublished toxicity data from EPA and other Federal Agencies, state agencies and private industry, and as such, dissemination of such information should be handled with discretion.

Acknowledgment is given to the many interested parties who have contributed information which aided in the preparation of this manual.

INTRODUCTION

This manual is separated into four sections which include two product sections, a manufacturer's product section and a reference section.

The products listed in Section A have the most information at this time, whereas only limited data were available for those products listed in Section B. For convenience in updating the manual as new products and new information on existing products become available, the sections are not paginated.

In Section C manufacturers are listed alphabetically with the products of each manufacturer cross-referenced to the section listings.

Section D lists references cited in the product sections.

SECTION A

The following dispersant products are listed in Section A:

ALKEN O.S.D.

AMEROID

AQUANEX MC

BACTO-ZYME

B&B 2021-S

B&B 2023

BESCO B-51-DT

BESCO D-EMULSION NO. 100

BESCO SLICK - 440

BLITZ

BP - 1002

BP - 1100

CASOL

COLLOID - 88

COREXIT 7664

COREXIT 8666

DI-CHEM 320

DISPERSE-OIL

DISPERSOL OS

F.O. 300-B

F.O. 300-H

FOILZOIL

(GAMLEN) D SOLVENT

GAMOSOL

GOLD CREW

HEMCO NO. 2

HOLL-CHEM #622

IGEPAL CO-430

IGEPAL CO-530

ISOMAL 265

JANSOLV-60 & 60W

LLCP-12

MAGIC POWER

MAGNUS

MET AQUACLENE 100

OD - 2

OIL SPILL ERADICATOR X-1-11

(PETROLITE) W-1439

(PETROLITE) WF-30

POLYCLENS (MOLTOKLAR)

POLYCOMPLEX A-11 & A-11 D

RIDZLIK

SEAMULSO E

SKANEX S-102

SLIX

SPILL- X

SURFLO RD 282

TALENT

TEOC 444

TEOC 777

TYFOSOL 80

(WYANDOTTE) SPILL REMOVER

ALKEN O.S.D.

MANUFACTURER	Alken-Murray Corporation 111 Fifth Avenue New York, New York 10003
COST	$2.99/gal. (55 gal. drum)
AVAILABILITY	F.O.B. Cleveland, Ohio
PRODUCT DESCRIPTION	Nonionic/anionic mixture of emulsifiers in 50% aromatic solvent
SPECIFIC GRAVITY	0.904 @ 60° F
FLASH POINT	180° F (C.O.C.)
SOLUBILITY	Miscible in water
SHELF LIFE	> 18 months
OTHER	Store @ 40° F to 110° F pH 9.2 - 9.6
HUMAN HAZARD	Maximum allowable concentration for inhalation >1,000 ppm

MANUFACTURER'S USE RECOMMENDATIONS

Application Method	Spray undiluted. Agitate. Reacts immediately.
Dosage	Dispersant to oil ratio 1:10 to 1:15 by volume
Use Limitations	Use above 35° F on light and heavy distillate residual and crude oils. Do not use below -5° F. Not for use in potable water supplies.
REMARKS	Manufacturer reports 99 (+) % effectiveness in laboratory tests. Maximum allowable concentration for marine life reported by manufacturer to be > 100 ppm.

AMEROID OIL SPILL EMULSIFIER #1

MANUFACTURER	Drew Chemical Corp. 522 Fifth Avenue New York, New York 10036
COST	$2.60 - $3.20/gal.
AVAILABILITY	Worldwide @ 121 points.
PRODUCT DESCRIPTION	Nonionic ethylene dioxide condensate with petroleum solvent.
SPECIFIC GRAVITY	0.960 @ 68° F
FLASH POINT	168° F (C.O.C.)
SOLUBILITY	Emulsifies in water
SHELF LIFE	Unlimited
OTHER	Store @ 10-150° F

MANUFACTURER'S USE RECOMMENDATIONS

Application Method	Educt @ 3 to 5% concentration using pressurized sprayer. Reaction time is immediate.
Dosage	Dispersant to oil ratio 1:20 to 1:33 by volume.
Use Limitations	Use on light and heavy distillate, residual and crude oils. Increase dosage on weathered crudes.

NOTE: Other Drew Chemical Corp. products that may be promoted for cleaning up oil spills: Drew Oil and Grease Remover, Ameroid HDE-777, Ameroid Oil & Grease Remover, Ameroid L.A.C.

EFFECTIVENESS:

Manufacturer reports 75% oil dispersed in lab tests.

Other: Dispersant to oil ratio of 1:10 to 1:20 required to disperse seven crude and three fuel oils. Least effective on Devonian Crude[17].

Spill Experience:

Incident	
Anne Mildred Brøvig, February 1966	Effectiveness unknown
Torrey Canyon, March 1967	Effectiveness unknown
General Colocotronis (Bahamas)	Effectiveness unknown

Toxicity Tests:

Species				Reference
Fathead minnow (Pimephales promelas)	96 hr TL_m -	6.1	ppm	(17)
Zebra fish (Brachydanio rerio) no survival	24 hrs @	20	ppm	(12)
Marine fish (Gambusia) 21 of 21 dead in	24 hrs @	15	ppm	

AQUANEX MC

MANUFACTURER	Montgomery Chemical Company P. O. Box 187 Jenkintown, Pennsylvania 19046
COST	$1.30 - $1.40/gal.
AVAILABILITY	F.O.B. Gloucester, New Jersey
SPECIFIC GRAVITY	0.830 @ 60° F
FLASH POINT	180° F Tag Open Cup
SHELF LIFE	Unlimited
OTHER	Store @ ambient to 120° F
HUMAN HAZARD	Minimal toxicity. MAC-500 ppm for inhalation

MANUFACTURER'S USE RECOMMENDATIONS

Application Method	Spray undiluted. Agitate. Reacts immediately.
Dosage	Dispersant to oil ratio estimated @ 1:10 by volume
Use Limitations	Recommended for use on light and heavy distillate, residual and crude oil.

BACTO-ZYME

MANUFACTURER	Nevada Enzymes, Inc. 3049 Riegel, Building C Las Vegas, Nevada 89012
COST	$3.95/gal. (1-55 gal. drum)
AVAILABILITY	F.O.B. Las Vegas, Nevada
PRODUCT DESCRIPTION	Ferment of organic materials - 92%; polyglycols - 2%; amines - 4%; esters - 2% (Liquid Corn Steep)
SOLUBILITY	Completely soluble in water
SHELF LIFE	Unlimited
OTHER	Store under 120° F
HUMAN HAZARD	Non-toxic

MANUFACTURER'S USE RECOMMENDATIONS

Application Method	Apply in fine spray diluted four times with water. Contact time 0 to 4 hours.
Use Limitations	Recommended for use on distillate and crude oils at temperatures above 50° F.
REMARKS	Ford Motor Company, Central Testing Lab., Dearborn, Michigan, found product to be very effective. Used by City of Denver, Colorado on July 1969 to clean up an asphalt paving residue on lake. Reportedly used by Dept. of Interior, Willow Beach Fish Hatchery at Lake Mead and found safe at a dilution of 25,000 to 1 when used to clean algae from raceways.

REFERENCE (14)

B&B 2021-S

MANUFACTURER	B&B Chemical Co., Inc. Box 796 Miami, Florida 33166
COST	$2.20/gal. (55 gal. drum)
AVAILABILITY	Available in bulk on East Coast
PRODUCT DESCRIPTION	Soaps 30-50%; aromatic solvents 48-65%; inhibitors 2-5%
SPECIFIC GRAVITY	0.91
FLASH POINT	> 150° F (C.O.C.)
SHELF LIFE	One Year
HUMAN HAZARD	200 ppm threshold limit value (inhalation)

MANUFACTURER'S USE RECOMMENDATIONS

Application Method	Spray undiluted with high pressure hoses. Agitate.
Dosage	1 gal. to 50-100 ft^2 on a thin slick
Use Limitations	Recommended for use on light and heavy distillate, residual and crude oils
REMARKS	Manufacturer reports 100% effectiveness on thin slicks in Florida waters. Exceeds requirements of MIL-S-22864 (Ships).

Spill Experience:

Incident

Bahamas Agricultural Ltd. of Owens-Illinois used product on oil spill in Bahamas.

Belcher Oil Co., Port Everglades, Florida used product to disperse Bunker C oil spill. Port Everglades Authority reports oil was effectively dispersed and no toxicity effects were observed.

REFERENCE (14)

B&B 2023

MANUFACTURER	B&B Chemical Co., Inc. Box 796 Miami, Florida 33166
COST	$2.85/gal. (55 gal. drums)
AVAILABILITY	Available in bulk on East Coast
PRODUCT DESCRIPTION	Nonionic detergents - 70%; water - 30%
SPECIFIC GRAVITY	1.01
FLASH POINT	None
SHELF LIFE	Unlimited
HUMAN HAZARD	1000 ppm threshold limit value (inhalation)

MANUFACTURER'S USE RECOMMENDATIONS

Application Method	Dilute to as much as 25 times with water and spray. Agitate. Reacts immediately.
Dosage	1 gal. to 50-100 ft^2 on a thin slick
Use Limitations	More effective at warm temperatures
REMARKS	Manufacturer reports 100% effectiveness on thin slicks. Used at U.S.N. Shipyards at Philadelphia (1969) and Charleston (1970).

REFERENCE (14)

BESCO B-51-DT

MANUFACTURER	The Besco Corporation 200 N. Myrtle Street Metairie, Louisiana 70004
COST	$1.80/gal. (1-20 55 gal. drums)
AVAILABILITY	F.O.B. New Orleans, Louisiana
PRODUCT DESCRIPTION	Detergent type with surfactants, coupling agents.
SPECIFIC GRAVITY	1.007
FLASH POINT	Non-flammable
VISCOSITY	34 cps @ 20° C
SOLUBILITY	Soluble in water
SHELF LIFE	Indefinite above freezing
HUMAN HAZARD	Non-toxic

MANUFACTURER'S USE RECOMMENDATIONS

Application Method	Spray undiluted with low pressure. Agitate after one to three minutes contact time.
Dosage	Dispersant to oil ratio 1:2 to 1:4 by volume.
REMARKS	Manufacturer reports very satisfactory effectiveness in treating oil spills over a fourteen month period.

REFERENCE (14)

BESCO D-EMULSION NO. 100

MANUFACTURER	The Besco Corporation 200 N. Myrtle Street Metairie, Louisiana 70004
COST	$1.60/gal. (1-20 55 gal. drums)
AVAILABILITY	F.O.B. New Orleans, Louisiana
PRODUCT DESCRIPTION	Aliphatic petroleum hydrocarbons, nonionic synthetic penetrating surface active agents and coupling agents.
SPECIFIC GRAVITY	0.815
FLASH POINT	120° to 140° F
VISCOSITY	1.65 cps @ 25° C
SOLUBILITY	Emulsifies in water
SHELF LIFE	Unlimited
HUMAN HAZARD	Non-toxic

MANUFACTURER'S USE RECOMMENDATIONS

Application Method	Spray undiluted with low pressure. Agitate after one to three minutes contact time.
Dosage	Dispersant to oil ratio 1:2 to 1:4 by volume
REMARKS	Manufacturer reports very good effectiveness in treating oil spills over eight year period. Product is presently being replaced by Besco-Slick-440.

REFERENCE (14)

BESCO SLICK - 440

MANUFACTURER	The Besco Corporation 200 N. Myrtle Street Metairie, Louisiana 70004
COST	$1.90/gal. (1-20 55 gal. drums)
AVAILABILITY	F.O.B. New Orleans, Louisiana
SPECIFIC GRAVITY	1.061
FLASH POINT	100° to 120° F (C.C.)
VISCOSITY	1.55 cps @ 25° C
SOLUBILITY	Emulsifies in water
SHELF LIFE	Unlimited
HUMAN HAZARD	Non-toxic

MANUFACTURER'S USE RECOMMENDATIONS

Application Method	Spray undiluted with low pressure. Agitate after one to three minutes contact time.
Dosage	Dispersant to oil ratio 1:2 to 1:4 by volume
REMARKS	Manufacturer reports very good effectiveness and improvement over Besco D Emulsion No. 100. Has been used to treat spills over 3 1/2 year period.

REFERENCE (14)

BLITZ

MANUFACTURER	The Clarkson Laboratories, Inc. 1450 Ferry Avenue Camden, New Jersey 08104 also 107 Fourth Avenue New York, New York 10003
COST	$1.95/gal.
AVAILABILITY	F.O.B. Camden, New Jersey or San Francisco, California
SPECIFIC GRAVITY	1.020
FLASH POINT	Non-flammable
SOLUBILITY	Soluble in water
SHELF LIFE	Unlimited
OTHER	Store @ 32° F to 100° F If desired, add 25% ethylene glycol to prevent freezing.
HUMAN HAZARD	Non-toxic

MANUFACTURER'S USE RECOMMENDATIONS

Application Method	Spray diluted 2:1 with water
Dosage	Dispersant to oil ratio 1:15 by volume
Use Limitations	Recommended for use on distillate fuel oil or fresh crude.
REMARKS	Manufacturer reports product disperses 100% of the oil that it emulsifies. Used in New York Harbor by Texaco Oil Company and in Camden, New Jersey to disperse gasoline spill on land (1967). Effectiveness not reported.

BP-1002

MANUFACTURER	BP North America, Inc. 620 Fifth Avenue New York, New York 10020
COST	$1.08/gal.
AVAILABILITY	F.O.B. United Kingdom
PRODUCT DESCRIPTION	Nonionic emulsifiers in aromatic petroleum solvent (kerosene) (60-70% aromatic), 3% coconut oil, 12% sulfonated dodecyl benzene.
SPECIFIC GRAVITY	0.88 @ 15.5° C
FLASH POINT	115° F (P.M.C.C.)
VISCOSITY	> 10 cp @ 20° C
SOLUBILITY	Emulsifies in water
HUMAN HAZARD	Non-toxic but prevent eye contact

MANUFACTURER'S USE RECOMMENDATIONS

Application Method	Spray undiluted. Contact time - none
Dosage	Dispersant to oil ratio 1:5 to 1:10 by volume
Use Limitations	Recommended for use on all oils both on water and shore.
REMARKS	Manufacturer reports product effective for sea and shore use.
Other	Dispersant to oil ratio of 1:10 emulsifies 82% of HD-SAE 20 motor oil.(1) Gulf Oil reports 1:10 ratio effective for black oils.

Spill Experience:

Incident

Anne Mildred Brøvig, February 1966, North Sea - Amount of oil treated unknown.

Torrey Canyon, March 1967, Cornwall, England - 540,000 gallons at sea
1,200,000 gallons on shore

It was estimated that use at sea prevented 14,000 tons of "Torrey Canyon" oil from reaching shore. Effectiveness reports are conflicting.

Toxicity Tests:

Species		Reference
Mummichog (Fundulus heteroclitus)	24 hr TL_m 10 mg/l 96 hr TL_m 10 mg/l	(13)
Pink Shrimp (Pandalus montagui)	48 hr TL_m 5.8 ppm	(3)
Brown Shrimp (Crangon crangon)	48 hr TL_m 5.8 ppm	(3)
Shore Crabs (Carcinus maenas)	48 hr TL_m 15. ppm	(3)
Cockles (Cardium edule)	48 hr TL_m 81. ppm	(3)
Marine Fish (Gambusia)	6 of 21 dead in 24 hr @ 1 ppm	(23)
	12 of 22 dead in 24 hr @ 15 ppm	(23)
	21 of 21 dead in 24 hr @ 30 ppm	(23)

BP-1100

MANUFACTURER	BP North America, Inc. 620 Fifth Avenue New York, New York 10020
COST	$1.00 - $1.50/gal.
AVAILABILITY	In U. S. - B.P. Corp., Marcus Hook, Pennsylvania
PRODUCT DESCRIPTION	Oil-soluble nonionic emulsifiers in petroleum-based solvents (non-aromatic)
SPECIFIC GRAVITY	0.82 - 0.83 @ 20° C
FLASH POINT	80° F (PMCC) Flammable
VISCOSITY	> 10 cp @ 20° C
SOLUBILITY	Emulsifies in water
HUMAN HAZARD	Non-toxic. Avoid inhalation or eye contact.

MANUFACTURER'S USE RECOMMENDATIONS

Application Method	Spray undiluted. Agitate.
Dosage	Dispersant to oil ratio 1:10 by volume.
Use Limitations	Recommended for use on all oils on water and shores. On sandy beaches spray one hour before tide comes in after exposing oily sand.

Toxicity Tests: Species	Reference
Brown shrimp (*Crangon crangon*) 48 hr TL_m > 3300 ppm	(14)

CASOL

MANUFACTURER	Wyandotte Chemicals Corp. J. B. Ford Division Wyandotte, Michigan 48192
COST	$2.00/gal. (55 gal. drum)
AVAILABILITY	Five manufacturing plants: Los Angeles, California; Stroudsburg, Pennsylvania; Atlanta, Georgia; Wyandotte, Michigan; and Venezuela
PRODUCT DESCRIPTION	Polyglycols - 20%; aliphatic solvents - 80%
SPECIFIC GRAVITY	0.82 - 0.88
FLASH POINT	> 190° F (T.C.C.) 100% volatile. Product will burn.
VISCOSITY	ca 5 cs.
SOLUBILITY	Emulsifies with water - mixes with oil type solvents
SHELF LIFE	Unlimited
OTHER	Store at 0° F to 140° F 5-day BOD @ 20° C 600,000 mg/l[15]
HUMAN HAZARD	Ingestion toxicity and toxic effects, as well as therapeutic treatment, same as for kerosene or fuel oil. Maximum allowable concentration 500 ppm 8 hour exposure.

MANUFACTURER'S USE RECOMMENDATIONS

Application Method	Spray undiluted. Agitate.
Dosage	Dispersant to oil ratio 1:5 by volume
Use Limitations	Recommended for use on light and heavy distillate, residual, and crude oils. Works best in fresh water, but has been successful in sea water.

Toxicity Tests:

Species			Reference
Fathead minnow (Pimephales promelas)	96 hr TL_m	32.0 ppm	(15)
Goldfish	24 to 96 hr LD_{50}	15 ppm	(25)

COLLOID-88 OIL SLICK DISPERSANT

MANUFACTURER	Colloid Chemical Co. 31 Perkins Street Brockton, Massachusetts 02402
COST	$2.50 - $3.75/gal.
AVAILABILITY	F.O.B. Brockton, Massachusetts
PRODUCT DESCRIPTION	An aqueous based suspension of microscopically sized particles of an inert mineral with emulsion stabilizers and penetrants in small amounts.
SPECIFIC GRAVITY	1.15 @ 77° F
FLASH POINT	Non-flammable
VISCOSITY	88 cp @ 68° F
SOLUBILITY	Insoluble in water
SHELF LIFE	Unlimited
OTHER	Fluid to 20° F
HUMAN HAZARD	Avoid eye or skin contact.

MANUFACTURER'S USE RECOMMENDATIONS

Application Method	Spray diluted 49 to 99 times with sea water at high pressure. Immediate reaction.
Dosage	Dispersant to oil ratio 1:2 to 1:50 by volume.
Use Limitations	Use on light and heavy distillate, residual and crude oils. Does not sink or permanently emulsify oil, only disperses it into minute floating globules. Do not use over shellfish beds.
REMARKS	Manufacturer reports one part of agent disperses 10 parts Bunker C or 50 parts No. 2 fuel oil. Product may be called S-1, or Coastal Services 88.

Spill Experience:

Incident

"Ocean Eagle", San Juan, Puerto Rico (March 1968)

Over 1000 spills treated in last two years in New England, Fort Lauderdale and Tampa, Florida.

City Service spill, Braintree, Massachusetts (June 1969)

Buzzards Bay, Massachusetts (September 1969)

Effectiveness not reported for above incidents.

Toxicity Tests:

Species		Ref.
Snails (*Litorina littorea*)	- Safe @ 1000 ppm with or without oil	(14)
Sea urchins	- Safe @ 1000 ppm with or without oil	"
Other fish	- Safe @ 1000 ppm with or without oil	"
Clams (*Mercenaria mercenaria*)	- Not safe for use over shellfish beds	
Softshell clam (*Mya arenia*)	- 96 hr TL_m 45 ppm	(33)
Mummichog (*Fundulus heteroclitus*)	96 hr TL_m 70 ppm	"
Winter flounder (*Pseudo pluronectes*)	96 hr TL_m 10 ppm*	"
Lobster (*Homorus americana*)	96 hr TL_m 46 ppm	"
Edible mussel (*Mytilus edulis*)	96 hr TL_m 54 ppm*	"
Atlantic silverside	96 hr TL_m 32 ppm	"

*tentative subject to revision

COREXIT 7664
AND
COREXIT 7664* (Star on Drum)

MANUFACTURER	Enjay Chemical Co. 60 West 49 Street New York, New York 10020
COST	$3.50 to $3.90/gal.
AVAILABILITY	Major ports and cities in U. S.
PRODUCT DESCRIPTION	Water-based nonionic-polyhydric alcohol ester of fatty acid with isopropyl alcohol and water solvents.

	Original 7664	Modified 7664*
SPECIFIC GRAVITY	1.004 @ 60° F	1.02 @ 60° F
FLASH POINT	90° F (T.O.C.)	> 175° F (T.O.C.)
VISCOSITY	30 Cs @ 100° F 500 Cs @ 32° F	160 SSU @ 100° F 115 Cs @ 32° F
SOLUBILITY	Soluble in water	Soluble in water
SHELF LIFE	Unlimited	
OTHER	Pour Point - 5° F 5-day BOD - 380,000 mg/l[15]	Pour Point + 25° F Store above 30° F
HUMAN HAZARD	Avoid eye contact. For inhalation threshold limit is 400 ppm.	

MANUFACTURER'S USE RECOMMENDATIONS

Application Method	Spray diluted 16 to 24 times with water. Reaction time - immediate on agitation.
Dosage	Dispersant to oil ratio 1:10 to 1:50 by volume.
Use Limitations	For use on light and heavy liquid oils (distillates, residuals and crude oils). Marginal effectiveness on oils with viscosities > 1000 Cs or under calm conditions without external agitation. Not effective below 25° F.

REMARKS Manufacturer reports 100% effectiveness in lab tests.

Dispersant to oil ratio of 1:2 to 1:5 was required to disperse seven crude oils and three fuel oils. Most effective on fuel oils and cambrian crude. Least effective on Leduc Crude. On a 1 (high) to 4 (low) scale, Corexit rated 2.5[17].

Spill Experience:

Incident

General Colocotronis off Bahamas	- 50 drums used.	Amount of oil treated - unknown.
Esso Essen off Africa	- 100 drums used.	Amount of oil treated - unknown.
Esso Andron off Africa	- 168 drums used.	Amount of oil treated - unknown.
Santa Barbara, California	- ? drums used.	Amount of oil treated - unknown.
Polycommander, Aruba N.W.I.	- 35 drums used.	Amount of oil treated - unknown.

Toxicity Tests:

Species

See attached table.

SUMMARY OF TOXICITY TESTS ON COREXIT 7664

Test Organism	Oil	Reported As	Concentration	Reference
Steelhead Fingerling	None	96 hr TL_m	15.8 mg/l	(6)
Pacific oyster larva (Crassotrea gigas)	None	Non-toxic	10 mg/l	"
	None	Toxic	40 mg/l	"
Shrimp (Penaeus sp.)	None	48 hr TL_m	5,000 ppm	(34)
Shrimp (Palaemonetes sp.)	None	48 hr TL_m	10,000 ppm	"
With 10X So. La. Crude Oil, depending on oil		48 hr TL_m	50-500 ppm	"
Mummichog (Fundulus heteroclitus)	None	24 hr TL_m	> 10,000 mg/l	(13)
		96 hr TL_m	2,300 mg/l	"
Fathead minnow (Pimephales promelas)	None	96 hr TL_m	> 3,200 ppm	(15)
With 2X Mich. Crude Oil		24 hr TL_m	1,800 ppm	"
Fundulus parvipinnis	None	24 hr TL_m	> 15,900 ppm	(18)
		96 hr TL_m	7,200 ppm	"
Fathead minnow (Pimephales promelas)	None	96 hr TL_m	> 10,000 ppm	(17)
Shrimp (Penaeus duorarum)	None	No Kill, 24 hrs	10,000 ppm	(23)
Fish (Gambusia)	None	No Kill, 48 hrs	10,000 ppm	"
Zebra fish (Brachydanio rerio)	None	No Kill, 24 hrs	15,000 ppm	(12)
Rockfish (Clinidae)	None	No Kill, 24 hrs	500-1,000 ppm	(32)
	None	No Kill, 12 hrs	10,000 ppm	"
Whelk (Burnupena sp.)	None	No Kill, 24 hrs	10,000 ppm	"
Limpet (Patella granularis)	None	Kill, 24 hrs	1-10,000 ppm	"

SUMMARY OF TOXICITY TESTS ON COREXIT 7664 (Cont'd)

Test Organism	Oil	Reported As		Concentration	Reference
Starfish (*Asterina exigua*)	None	No Kill,	24 hrs	500- 1,000 ppm	(32)
Abalone (*Haliotis midae*)	None	Behavioral Stress,	6 hrs	> 10- 500 ppm	"
Rock Lobster (*Fasus lalandii*)	None	No Kill,	24 hrs	500 ppm	"
Periwinkles (*Oxystele variegata*)	None	No Kill,	24 hrs	10,000 ppm	"
Pacific northern onchovy (*Engraulis mordax*)	None		118 hrs TL_m	10 ppm	(35)
Sailfin Molly (*Poecilla latipinna*) With 10X So. La. Crude	Oil	All alive,	24 hrs	1,000 ppm	(23)
		All dead,	24 hrs	10,000 ppm	"
Oysters	None	No effects,	8 days	8,000 ppm	"
Atlantic salmon parr	None	No Kill,	96 hrs	500 ppm	"
Herring	None		142 hrs TL_m	500 ppm	"
Bluegill	None		96 hrs TL_m	398 ppm	(33)
Yellow Peach	None		96 hrs TL_m	398 ppm	"

COREXIT 8666

MANUFACTURER	Enjay Chemical Co. 60 West 4th Street New York, New York 10020
COST	$3.50 to $3.90/gal.
AVAILABILITY	Major ports and cities in U. S.
PRODUCT DESCRIPTION	Same as Corexit 7664 except contains aliphatic hydrocarbon solvent.
SPECIFIC GRAVITY	0.840 @ 60° F
FLASH POINT	185° F (T.O.C.)
VISCOSITY	25 Cs @ 32° F 57 Cs @ 0° F 50 SSU @ 100° F
SOLUBILITY	Disperses in water
SHELF LIFE	Unlimited
OTHER	Pour point -80° F
HUMAN HAZARD	Avoid eye and skin contact

MANUFACTURER'S USE RECOMMENDATIONS

Application Method	Spray full strength as a thin film. Agitate. Reacts immediately.
Dosage	Dispersant to oil ratio 1:10 to 1:100 by volume.
Use Limitations	Use on light at heavy liquid distillate, residual and crude oils. Not for use in potable water supplies.
REMARKS	Manufacturer reports product particularly effective for heavy viscous fuel and crude oils. Product will disperse 10 to 25 its own volume of oil.

Spill Experience:

Incident	
Tanker "Arrow", Nova Scotia, Canada	- Very limited use with unknown results.
"Delian Appollon", Tampa Bay, Florida	- Used on shore. Effectiveness not reported.

Toxicity Tests:

Species			Reference
Sailfin molly (*Poecilla latipinna*)	24 hr, No Kill	10,000 ppm	(24)
Zebra fish (*Brachydanio rerio*)	24 hr, No Kill	20,000 ppm	(12)
	96 hr, Non-toxic	10,000 ppm	(14)

TOXICITY DATA ON COREXIT 8666[24]

MARINE BIOLOGICAL ASSOCIATION OF THE U.K., PLYMOUTH

Corexit 8666 after	Number of Gobies (Gobius minutus) dead / Number of Gobies tested 24 hrs.	48 hrs.	72 hrs.	96 hrs.
Control	0/10	0/10	1/10	1/10
10,000 ppm	0/10	0/10	0/10	0/10
5,000 ppm	0/10	1/10	1/10	2/10
Corexit 8666 + Oil ppm				
2000 + 8000 (4000)	0/10	2/10		
1000 + 4000 (1700)	0/10	0/10		
500 + 2000 (930)	0/20	0/20		
2000 + 8000 (2000)	0/10	2/10	2/10	3/10 (5 survivors poor)
1000 + 4000 (1000)	0/10	1/10	2/10	5/10
500 + 2000 (500-1000)	0/10	0/10	0/10	0/10
	Number of Shrimp (Crangon crangon) dead / Number of Shrimp tested			
1000 + 4000	0/10	7/10 (3 survivors poor)		
500 + 2000	1/10	4/10	7/10	7/10
200 + 800	0/10	2/10	3/10	4/10
100 + 400 (200)	0/15	1/15	5/15	6/15

NOTES: 1. Number in parenthesis represents actual oil measured in suspension. Note comparison to concentration of oil added.

2. Oil used was Kuwait crude residue after topping at 250° C.

TOXICITY DATA ON COREXIT 8666[24]

From Sprague, J. B., "Progress Report on Toxicity of Corexit and/or Bunker C Oil". Fisheries Board of Canada (March 2, 1970).

Extensive tests on Corexit 8666 alone and with oil were initiated as a result of its proposed use following the ARROW spill in Nova Scotia. These tests included:

- Pollack in sea water at about 3-5° C.
- Tilapia (a tropical fish) in half sea water at 23° C.
- Salmon in fresh water at 4° C and 15° C.
- Shore crab in sea water at 4° C.
- Winter flounders at 4° C.
- Lobsters at 4° C.

Some typical results included:

- 1000 ppm Corexit 8666 did not kill Pollack or Tilapia after two days.
- 1000 ppm Corexit 8666 did not kill salmon or shore crab after six days.
- 50,000 ppm Corexit 8666 + Bunker C was lethal threshold to beach-living marine crustacean (Gammarus oceanicus).
- 1000 ppm Corexit 8666 + 1000 ppm Bunker C was slowly lethal to small salmon and killed same in 2-4 days; one of two shore crabs died after 4 days, the other survived 6 days.

DI-CHEM 320

MANUFACTURER	Diversified Chemicals Corp. 8100 Electric Avenue Stanton, California 90680
COST	$2.15/gal. (55 gal. drum)
AVAILABILITY	F.O.B. Stanton, California
PRODUCT DESCRIPTION	Anionic - 26%; water diluent 50%
SPECIFIC GRAVITY	1.035 @ 60° F
FLASH POINT	Non-flammable
SOLUBILITY	Soluble in water
SHELF LIFE	More than two years
OTHER	Storage @ 30° F to 120° F
HUMAN HAZARD	Avoid prolonged skin contact

MANUFACTURER'S USE RECOMMENDATIONS

Application Method	Apply by high pressure spray (500-2000 psi) with positive displacement pump and eductor diluting 50 times with water. Agitate. Reacts immediately.
Dosage	Oil to dispersant ratio 1:5 to 1:50 by volume
Use Limitations	Recommended for use on light and heavy distillate, residual and crude oils.
REMARKS	Manufacturer reports 100% of oil dispersed. One ppm disperses five ppm oil. No separation of oil when 5 cc of oil and 50 to 5000 ppm dispersant were mixed with 95 cc of water.

REFERENCE (14)

Toxicity Tests: Species	Reference
No effects with tropical fish @ 50 ppm	(25)

DISPERSE-OIL

MANUFACTURER	Pepper Tank Cleaning Co. 2000 McKinley Avenue National City, California 92050
COST	$1.20 to $1.25/gal.
AVAILABILITY	F.O.B. National City, California
PRODUCT DESCRIPTION	A concentrated mixture of water-based synthetic detergents and surface active agents fortified with highly active phosphates.
SPECIFIC GRAVITY	1.030 @ 60° F
FLASH POINT	Non-flammable
SOLUBILITY	Soluble in water. Compatible with petroleum solvents.
SHELF LIFE	One year (at least)
OTHER	Store above 32° F Freezes at 32° F without separation
HUMAN HAZARD	Non-toxic

MANUFACTURER'S USE RECOMMENDATIONS

Application Method	Apply by high pressure (300 psi) sprayer, with eductor, diluting 4 to 6 times with sea water for Bunker C, and diluting 2 times with sea water for diesel oil. May also be applied as foam, although effectiveness is decreased. Agitate. Reacts immediately.
Dosage	Dispersant to oil ratio 1:1 to 1:4 by volume for Bunker C. 1:6 to 1:10 by volume for diesel and JP-4.
Use Limitations	Recommended for use on light and heavy distillate, residual and crude oils. Not effective on heavy asphalt residuals. Not for use in potable water supplies.

Spill Experience:

Incident

November 1968 - 86,000 gallons of Bunker C in San Diego Bay dispersed with 21,000 gallons of product. Numerous spills (80-100/yr) of distillate and Navy special in San Diego Bay(14). Effectiveness not determined.

Toxicity Tests:

Species		Reference
Mummichog (*Fundulus heteroclitus*)	24 hr TL_m 42 ppm	(25)
	48 hr TL_m 42 ppm	
	96 hr TL_m 40 ppm	

DISPERSOL OS

MANUFACTURER	ICI America, Inc. 151 South Street Stamford, Connecticut 06904
COST	$2.76/gal.
PRODUCT DESCRIPTION	Nonionic polyethanoxy compound approximately 10%; isopropanol diluent approximately 90%.
SPECIFIC GRAVITY	0.796 @ 68° F
FLASH POINT	53° F (Abel C.C.) Highly inflammable
VISCOSITY	1 cp @ 68° F
SOLUBILITY	Active agent insoluble in water. Completely soluble in oil.
SHELF LIFE	Unlimited
OTHER	Store between 23° F - 140° F Boiling point: 179.6° F Pour point - free flowing down to -5° C
HUMAN HAZARD	Harmful to eye tissue. Concentrations of isopropanol greater than 400 ppm by volume are unsatisfactory for working conditions. Explosive limits by volume in air: Lower 2% Upper 12% Vapor is heavier than air.

MANUFACTURER'S USE RECOMMENDATIONS

Application Method	Spray undiluted. Spraying equipment must be grounded. During use there should be no smoking, sparks or open flames.
Dosage	1 gallon per 20/yd^2 of slick, 250 gallons/acre. Dispersant to oil ratio 1:2 to 1:10 by volume.
Use Limitations	Recommended for use on light and heavy distillate, residual and crude oils.

Toxicity Tests:

Species				Reference
Brown Shrimp		LD_{50}	3000/10,000 ppm	(14)
Sea Shrimp		LD_{50}	1%	(25)
Gobies (Gobius minutus)	No survival	24 hrs	1,000 ppm	(24)
	6 of 10 dead	48 hrs	500 ppm	
	5 of 10 dead	72 hrs	200 ppm	

F.O. 300-B

F.O. 300-H*

MANUFACTURER	Fine Organics, Inc. 205 Main Street Lodi, New Jersey 07644
COST	$1.80/gal.
AVAILABILITY	F.O.B. Lodi, New Jersey
PRODUCT DESCRIPTION	Synthetic emulsion degreasers. Nonionics, 10%; aromatic hydrocarbons, 41%; aliphatic hydrocarbon, 49%. Also contains couplers and inhibitors.
SPECIFIC GRAVITY	0.875
FLASH POINT	180° F (C.O.C.) for 300-B 210° F (C.O.C.) for 300-H
VISCOSITY	> 0.5 poises
OTHER	Storage @ 0° F to 140° F for 300-B @ 0° F to 180° F for 300-H

MANUFACTURER'S USE RECOMMENDATIONS

Application Method	Spray undiluted. Agitate. May be diluted with fuel oil, fresh or salt water.
Dosage	Dispersant to oil ratio 1:2 by volume.
Use Limitations	Recommended for light and heavy distillate, residual and crude oils.
REMARKS	Used on local harbor spills, Newark Bay, Passaic River, Delaware River, 1966-1968[14]. Effectiveness not determined.

*Formula identical except for a higher boiling aliphatic hydrocarbon which results in higher flash point. Results will be equal to 300-B.

Toxicity Tests:

Species			Reference
Steelhead minnow fingerlings		96 hrs TL_m 65.0 ppm	(6)
Pacific oyster larvae *Crassotrea gigas*	Toxic	4.0 ppm	(6)
	Non-toxic	1.0 ppm	

FOILZOIL

MANUFACTURER	Sea-Air Chemical Corp. 32-00 Borden Avenue Long Island City, New York 11106
COST	$2.05/gal.
AVAILABILITY	F.O.B. Long Island City, New York
PRODUCT DESCRIPTION	Tank cleaner. Polyglycols (non-solvent)
SPECIFIC GRAVITY	1.02 @ 68° F
FLASH POINT	Non-flammable
VISCOSITY	Slightly more than water
SOLUBILITY	Soluble in water
SHELF LIFE	Unlimited
OTHER	Keep from freezing
HUMAN HAZARD	Non-toxic

MANUFACTURER'S USE RECOMMENDATIONS

Application Method	Coarse spray - contact time varies. Can be sprayed diluted with equal quantity of water.
Dosage	Dispersant to oil ratio 1:5 by volume or 10 gals/1000 ft^2 of oil slick.
Use Limitations	Use on petroleum oils and distillate fuels.
REMARKS	Manufacturer reports 96% of oil dispersed in field tests.

Toxicity Tests:

Species		Reference
Mummichog (*Fundulus heteroclitus*)	24 hr TL_m 42 mg/l	(13)
	96 hr TL_m 31 mg/l	(13)

(GAMLEN) D SOLVENT

MANUFACTURER	Gamlen Chemical Co. 321 Victory Avenue South San Francisco, California 94080
COST	$2.10/gal.
PRODUCT DESCRIPTION	Tank and bilge cleaning solvent. Highly concentrated detergent containing kerosene.
SPECIFIC GRAVITY	0.870 @ 70° F
FLASH POINT	> 150° F (C.O.C.)
OTHER	Fire Pt.: 165° F (min.) B.O.D. 864,000 mg/l[19]
HUMAN HAZARD	Avoid eye and skin contact
APPLICATION METHOD	Spray
REMARKS	In lab tests 1:1 ratio emulsified 16.1% of Navy Special grade fuel oil[9].

Toxicity Tests:

Species		Reference
Pink shrimp (*Pandalus montagui*)	48 hr TL_m 11.5 mg/l	(3)
Brown shrimp (*Crangon crangon*)	48 hr TL_m 9.6 mg/l	"
Cockles (*Cardium edule*)	48 hr TL_m 38.8 mg/l	"
Daphnids (*Daphnia magna*)	24 hr TL_m 13.7 ppm	(19)
" " "	48 hr TL_m 2.9 ppm	"
" " "	72 hr TL_m 1.5 ppm	"
" " " w/crude oil	24 hr TL_m 24.4 ppm	"
" " " " " "	48 hr TL_m 10.7 ppm	"
" " " " " "	72 hr TL_m 9.1 ppm	"
Bluegills - Kills within 5 minutes @	10.0 ppm	"

GAMOSOL OIL SPILL REMOVER

MANUFACTURER	Gamlen Chemical Co. 321 Victory Avenue South San Francisco, California 94080 also 11 Broadway New York, New York 10017
COST	$3.25/gal. (1-55 gal. drum)
AVAILABILITY	South San Francisco, California East Paterson, New Jersey Mobile, Alabama
PRODUCT DESCRIPTION	Tanker and bilge cleaning solvent. Polyglycols, 9%; polyethanol, 18%; aromatic hydrocarbons, 73%.
SPECIFIC GRAVITY	0.92 @ 60° F
FLASH POINT	> 150° F (C.O.C.)
VISCOSITY	43 S.S.U. @ 100° F
SOLUBILITY	Emulsifies in water
SHELF LIFE	Unlimited
OTHER	Fire point: 155° F Store @ 0° to 125° F
HUMAN HAZARD	Avoid eye or skin contact

MANUFACTURER'S USE RECOMMENDATIONS

Application Method	Spray as a solid jet, undiluted, through a small jet nozzle under pressure or dilute 5 to 10 times with water. Immediate reaction.
Dosage	Dispersant to oil ratio 1:6 to 1:10 by volume.
Use Limitations:	For use on light and heavy distillate, residual and crude oils. Minimal effects @ 28° F.
REMARKS	Manufacturer reports 95% of oil dispersed. Product meets specification of MIL-S-A22864 (ships). In lab tests at 1:1 ratio emulsified 20.8%(9) and 26.7%(16) of Navy Special grade fuel oil (referred to as Gamosol at time of tests). Principal oil spill emulsifier stocked by Royal Navy at time of Torrey Canyon incident. Used by Royal Navy in England and Australia.

Spill Experience:

Incident

Anne Mildred Brøvig, February 1966 - Effectiveness undetermined

Torrey Canyon, March 1967 - Effectiveness undetermined

Toxicity Tests:

Species		Reference
Mummichog (Fundulus heteroclitus)	24 hr TL_m 6.4 mg/l	(13)
	96 hr TL_m 6.4 mg/l	(13)
Zebra fish (Brachydanio rerio) No survival.....	24 hr @ 15 ppm	(12)
Pink shrimp (Pandalus montagui)	48 hr TL_m 12.5ppm	(3)
Brown shrimp (Crangon crangon)	48 hr TL_m 8.8ppm	(3)
Shore crabs (Carcinus maenas)	48 hr TL_m 20.4ppm	(3)
Cockles (Cardium edule)	48 hr TL_m 15.8ppm	(3)

GOLD CREW DISPERSANT

MANUFACTURER	Ara Chem, Inc. P. O. Box 5031 San Diego, California 92105
COST	$2.50 - $2.75/gal.
AVAILABILITY	F.O.B. San Diego, California
PRODUCT DESCRIPTION	Concentrated water-based nonionics and lesser quantity of arly-sulfonates.
SPECIFIC GRAVITY	1.035 @ 68° F
FLASH POINT	Non-flammable
VISCOSITY	300 cp @ 68° F
SOLUBILITY	Soluble in water
SHELF LIFE	Unlimited
OTHER	Store @ 0° F to 180° F
HUMAN HAZARD	Avoid eye or open-cut contacts. Non-irritating to skin.

MANUFACTURER'S USE RECOMMENDATIONS

Application Method	Spray in a hard coarse spray, diluted 80 times with water @ 150 to 175 psi pressure using Ara-Chem System *which includes injector pump, 200-300 gpm spray pump and two 1 1/2" spray nozzles. No other agitation required.
Dosage	Dispersant to oil ratio 1:5 to 1:15 by volume.
Use Limitations	Use on light and heavy distillate, residual and crude oils up to semi-solid weathered state at any temperature. Not recommended for beach cleaning although product is claimed quite effective for this purpose.
REMARKS	Manufacturer reports 100% of oil dispersed. One part product to 30 parts oil in lab tests.

*The Ara Chem System cuts a 60-foot swath through the oil slick at boat speeds of 3 to 6 mph with dispersant usage of 1/2 to 3 bbls/hr. The system is continuous, requiring no prior mixing of dispersant.

At 1:1 ratio emulsified 27.1% Navy Special fuel oil[9].

Spill Experience:

Incident

San Diego Bay, California - 8 years experience on U. S. Navy Oil Spills.

Santa Barbara, California (Feb. 1969). Effectiveness not reported.

Toxicity Tests:

Species		Reference
Fundulus parvipinnis	24 hr TL_m 128 ppm	(18)
	96 hr TL_m 128 ppm	

HEMCO NO. 2

MANUFACTURER	Hemisphere Marine Chemicals Co., Inc. 300 Main Street Orange, New Jersey 07050
COST	$2.75/gal.
AVAILABILITY	F.O.B. Orange, New Jersey also Halifax, N.S.; Portland, Maine; and Gulf Coast; Caribbean Islands and Canal Zone
PRODUCT DESCRIPTION	Aromatic solvent type emulsifier
SPECIFIC GRAVITY	0.895 @ 60° F
FLASH POINT	160° F (C.O.C.)
OTHER	Solvent is not biodegradable

MANUFACTURER'S USE RECOMMENDATIONS

Application Method	Spray undiluted. Contact time, 15 to 20 minutes before agitation. Educted - dilute 24 to 49 times with water for cleaning beaches and rocks.
Dosage	Varies
Use Limitations	For use on oil polluted beaches and harbor waters from -70° F to 140° F.

Spill Experience:

Incident

Ocean Eagle, San Juan, Puerto Rico (March 1968).
Halifax, Nova Scotia by Atlantic Salvage and Dredging Co.
Palm Beach, Florida by Spencers Boatyard.
West Palm Beach, Florida by Florida Diesel Co. (1966-1969).
New York Harbor by William J. Snee Co. (1970).

Effectiveness not reported on above.

Toxicity Tests:

Species			Reference
Silversides (Atherinomorus stipes)	6 hrs TL_{100}	100 ppm	(14)
Moharra (Eucinostomus argenteus)	6 hrs TL_{100}	27 ppm	(14)
	24 hrs all survived	10 ppm	(14)

HOLL-CHEM #622
OIL SPILL DISPERSANT

MANUFACTURER	Holl-Chem, Inc. 502-A Maritime Building Seattle, Washington 98104
COST	$3.15 - $3.30/gal.
AVAILABILITY	F.O.B. Seattle, Washington 98104
PRODUCT DESCRIPTION	Polyglycols, 23%; alkyl-aryl sulphonates, 14.5%; aromatic petroleum solvent, 62.5%.
SPECIFIC GRAVITY	0.958 @ 60° F
FLASH POINT	205° F (C.O.C.)
SOLUBILITY	Soluble in water
SHELF LIFE	Unlimited
OTHER	Store @ 0-140° F

MANUFACTURER'S USE RECOMMENDATIONS

Application Method	Spray. Agitate immediately.
Dosage	Dispersant to oil ratio 1:10 by volume but varies.
Use Limitations	Use @ 40° F or above on light and heavy distillate residual and crude oil. Not effective on weathered crudes. Not for beach cleaning.
REMARKS	Manufacturer reports 99% effectiveness and 10 years experience of product use in Puget Sound and coastal waters from Alaska to Oregon. Lab tests rated product as 2 on a scale 1 (low) to 4 (high) tested visually on medium weight crude oil (API Gravity 29.9)[17].

Toxicity Tests:

Species			Reference
Steelhead minnow	96 hr TL_m 3.2 mg/l		(6)
Pacific oyster larvae	- Toxic	0.1 ppm	(6)
Crassotrea gigas	- Non-toxic	0.01 ppm	(6)

IGEPAL CO-430

MANUFACTURER	GAF Corporation 140 West 51 Street New York, New York 10020
COST	$1.28 to $1.78/gal.
AVAILABILITY	Linden, New Jersey and Calvert City, Kentucky
PRODUCT DESCRIPTION	Nonionic. Ethoxylated nonyphenal (44% ethylene oxide), no solvent.
SPECIFIC GRAVITY	1.02 @ 77° F
FLASH POINT	500 - 600° F (O.C.)
VISCOSITY	175-250 cp @ 77° F
SOLUBILITY	Insoluble but dispersible in water.
SHELF LIFE	Unlimited
OTHER	No limit on storage temperatures.

MANUFACTURER'S USE RECOMMENDATIONS

Application Method	Eduction @ 2 to 5% concentration.
Dosage	Dispersant to oil ratio 1:33 to 1:100 by volume.
Use Limitations	Use on light and heavy distillate, residual and crude oils.

REFERENCE (14)

IGEPAL CO-530

MANUFACTURER	GAF Corporation 140 West 51 Street New York, New York 10020
COST	$1.30 to $1.82/gal.
AVAILABILITY	Linden, New Jersey and Calvert City, Kentucky
PRODUCT DESCRIPTION	Nonionic. Ethoxylated nonyphenal (54%, ethylene oxide), no solvent.
SPECIFIC GRAVITY	1.04 @ 77° F
FLASH POINT	480-510° F (O.C.)
VISCOSITY	175-250 cp @ 75° F
SOLUBILITY	Insoluble but dispersible in water.
SHELF LIFE	Unlimited
OTHER	No limit on storage temperatures.

MANUFACTURER'S USE RECOMMENDATIONS

Application Method	Eduction @ 2 to 5% concentration.
Dosage	Dispersant to oil ratio 1:33 to 1:100 by volume
Use Limitations	Use on light and heavy distillate, residual and crude oils.

REFERENCE (5) (14)

ISOMAL 265

MANUFACTURER	Johnson-March Corp. 3rd and Berks Street Philadelphia, Pennsylvania 19122
COST	$2.44/gal. (0.28/lb. in 500 lb. drum)
AVAILABILITY	F.O.B. Philadelphia, Pennsylvania 19122
PRODUCT DESCRIPTION	Sulfonated ester, 65%; water, 20%.
SPECIFIC GRAVITY	8.7 lbs/gal @ 78° F
FLASH POINT	ca 400° F (C.O.C.)
SHELF LIFE	Unlimited
OTHER	Store @ ambient temperatures.

MANUFACTURER'S USE RECOMMENDATIONS

Application Method	Spray undiluted or diluted three times with sea water, mineral spirits or kerosene. Agitate immediately.
Dosage	Dispersant to oil ratio 1:1000 to 1:5000 by volume.
Use Limitations	Light oils and fresh crudes.

REFERENCE (14)

JANSOLV-60
JANSOLV-60 W*

MANUFACTURER	Sunshine Chemical Corp. P. O. Box 2041 West Hartford, Connecticut 06117 also P. O. Box 5534 Jacksonville, Florida 32207
COST	$2.00/gal.
AVAILABILITY	F.O.B. Jacksonville, Florida; West Hartford, Connecticut; and Highland Park, Illinois.
PRODUCT DESCRIPTION	Nonionic water-based surfactants and petroleum-based solvent.
SPECIFIC GRAVITY	0.95 @ 75° F
FLASH POINT	154° F (T.O.C.)
VISCOSITY	35 sec. @ 75° F, Ford No. 4 Cup
SOLUBILITY	Soluble in water
SHELF LIFE	Four years
OTHER	Store Jansolv 60 @ 32° F to 250° F Store Jansolv 60 W @ -10° F to 250° F 5-day BOD - 350,000 mg/l[15]
HUMAN HAZARD	Non-toxic. Threshold limit 500 ppm in air.

MANUFACTURER'S USE RECOMMENDATIONS

Application Method	Spray or educt by fire hose diluted 33 to 100 times with water. Reacts immediately.
Dosage	Varies, depending on oil spilled.
Use Limitations	Use on light and heavy distillate, residual and crude oils. Not effective on sandy beaches.
REMARKS	At 1:1 ratio emulsifies 91.4% of Navy Special grade fuel oil[9].

*Same as Jansolv 60 except for additive to allow use to -10° C.

Spill Experience:

Incident

Ocean Eagle, San Juan, Puerto Rico. Effectiveness unknown.

Toxicity Tests:

Species				Reference
Steelhead minnow fingerlings	96 hr TL_m	35.5	mg/l	(6)
Mummichog (Fundulus heteroclitus)	24 hr TL_m	60	mg/l	(13)
	96 hr TL_m	27	mg/l	(13)
Fathead minnow (Pimephales promelas)	96 hr TL_m	9.5	mg/l	(17)
Pacific oyster larvae (Crassotrea gigas)	Toxic	0.8	ppm	(6)
	Non-toxic	0.4	ppm	
Silversides (Atherinomorus stipes)	6 hr TL_{100}	50	ppm	(20)
	18 hr TL_0	10	ppm	(20)
Moharra (Eucinostomus argentus)	6 hr TL_{100}	27	ppm	(20)

LCP-12
OIL SLICK DISPERSER

MANUFACTURER	Crain Industrial Products Corp. P. O. Box 34233 Farmers Branch, Texas 75234 also P. O. Box 1062 2411 Swiss Avenue Dallas, Texas 75221
COST	$2.30 - $2.80/gal.
AVAILABILITY	F.O.B. Farmers Branch, Texas
PRODUCT DESCRIPTION	Octyl-phenoxy-polyethoxy-ethanol, blended with other ingredients
SPECIFIC GRAVITY	8.3 lbs/gal.
FLASH POINT	Non-flammable
VISCOSITY	Slightly viscous
SOLUBILITY	Soluble in water
OTHER	Freezing point, approximately 0° C
HUMAN HAZARD	Non-toxic

MANUFACTURER'S USE RECOMMENDATIONS

Application Method	Spray diluted 3 times with water on light oil slicks. Spray undiluted on thick slicks or heavy oils. Agitate. Reacts immediately.
Dosage	For use on light and heavy oils and sludges.

Toxicity Tests:

Species				Reference
Mummichog	(Fundulus heteroclitus)	24 hr TL_m	140 mg/l	(13)
"	" "	96 hr TL_m	140 mg/l	"
Daphnids	(Daphnia magna)	24 hr TL_m	694 mg/l	(19)
"	" "	48 hr TL_m	290 mg/l	"
"	" "	96 hr TL_m	204 mg/l	"
"	" " w/crude oil	24 hr TL_m	370 mg/l	"
"	" " " "	48 hr TL_m	275 mg/l	"
"	" " " "	96 hr TL_m	102 mg/l	"

MAGIC POWER OIL
DISPERSENT OD #1

MANUFACTURER	Lawton Specialty Co., Inc. P. O. Box 44 Lawton, Oklahoma 73501
COST	$3.35/gal.
AVAILABILITY	F.O.B. Lawton, Oklahoma or Dallas, Texas
PRODUCT DESCRIPTION	Nonionic. Contains wetting agents and emulsifiers in a naptha solvent.
SPECIFIC GRAVITY	0.84 @ 75° F
FLASH POINT	176° F (C.O.C.)
VISCOSITY	1-6 cp @ 75° F
SOLUBILITY	Emulsifies in water
SHELF LIFE	1 year (possibly longer)
OTHER	5-day BOD @ 20° C - 880 mg/l[15]. Store @ 20° F to 140° F.
HUMAN HAZARD	None when used diluted. Estimated threshold limit for inhalation 300 to 350 ppm at 60 to 80° F.

MANUFACTURER'S USE RECOMMENDATIONS

Application Method	Spray diluted 1 to 5 times with water. Agitate. Reacts immediately.
Dosage	Dispersant to oil ratio 1:10 to 1:2000 by volume.
Use Limitations	Use on light and heavy distillate, residual and crude oils.

Toxicity Tests:

Species		Reference
Fathead minnow (*Pimephales promelas*)	96 hr TL_m 14.0 ppm	(15)

MAGNUS OIL SPILL DISPERSER

MANUFACTURER	Magnus Chemical 400 South Avenue Garwood, New Jersey 07027
COST	$2.85/gal.
AVAILABILITY	Inventory at thirteen locations.
PRODUCT DESCRIPTION	Alkyl-aryl-benzene, nonionic wetting agents, petroleum diluent and odor masking (3%), stabilizing and combining agents.
SPECIFIC GRAVITY	0.892 @ 60° F
FLASH POINT	170° F
VISCOSITY	30.8 seconds Zahn cup No. 1 @ 60° F
SOLUBILITY	Emulsifies in water
SHELF LIFE	Unlimited
OTHER	pH 8.0. Store at 0° to 130° F. Freezing point 0° C.
HUMAN HAZARD	Avoid eye or skin contact. 500 ppm maximum for inhalation.

MANUFACTURER'S USE RECOMMENDATIONS

Application Method	Apply undiluted as a heavy droplet spray. Do not fog or mist chemicals as it reduces efficiency. The product can be applied by low volume (0-3 gpm), low pressure (10-30 psi) pump, or by air driven drum pump; a lube pump, or pressure-pot top sprayer. May also be educted at 3 to 5% by volume.
Dosage	Dispersant oil ratio at 50° F. 1: 8 to 1:10 by volume for Bunker C. 1: 3 to 1: 5 by volume for weathered crude. 1:20 by volume for distillate fuels. Contact time 10-20 minutes for penetration.
Use Limitations	For use on gasoline, kerosene, heating oil, jet fuel, Bunker C, other distillate fuels and crude oil. Not a beach cleaner. Best results at 50° F and above. Not effective on heavy asphalt residues.

REMARKS

Manufacturer reports product passes all tests of MIL-Spec C 22864A (Ships).

At 1:1 ratio 36.6% of Navy Special Fuel oil was emulsified in lab tests(9).

Spill Experience:

Incident

(General Colocotronis) Eleuthera Island, Bahamas - 150 drums used. Effectiveness not determined.

Ocean Eagle, San Juan, and Ensenada Harbors, Puerto Rico - Ineffective.

Albany, New York - 50,000 gallon heavy oil spill. Effectiveness unknown.

Norfolk, Virginia - used by Industrial Marine Service, Inc. after physical removal of most of the oil - Effectiveness unknown.

Toxicity Tests:

Species			Reference
Pinfish (Lagadon rhomboides)	48 hr TL_m	26.9 ppm	(25)
Mummichog (Fundulus heteroclitus)	48 hr TL_m	10 ppm	(14)
" " "	24 hr TL_m	175 ppm	(13)
" " "	96 hr TL_m	43 ppm	"
Zebra fish (Brachydanio rerio)			
1 of 5 survived	24 hrs @	40 ppm	(12)
Marine fish (Gambusia)			
4 of 21 dead	24 hrs @	1 ppm	(23)
6 of 21 dead	24 hrs @	15 ppm	"
16 of 21 dead	24 hrs @	30 ppm	"

NOTE: Two other Magnus products not recommended by manufacturer for dispersing oil spills on water are two degreasers - Magsol 3 and 701.

MET AQUACLENE 100

MANUFACTURER	Metropolitan Petroleum Petrochemicals Co., Inc. 24 Caven Point Road Jersey City, New Jersey 07304
COST	$3.75/gal.
AVAILABILITY	F.O.B. Jersey City, New Jersey (> 50 miles)
PRODUCT DESCRIPTION	Nonionic - Blend of alkanolamides - 100%
SPECIFIC GRAVITY	1.004 @ 60° F
FLASH POINT	350° F (P.M.C.C.)
VISCOSITY	135 SSF @ 70° F 185 SSF @ 40° F
SOLUBILITY	Completely soluble in water
SHELF LIFE	Unlimited
OTHER	pH 9.8. Freezing point 25° F. Store @ 15° to 200° F. 5-day BOD @ 20° C - 840,000 mg/l[15].
HUMAN HAZARD	Non-toxic

MANUFACTURER'S USE RECOMMENDATIONS

Application Method	Spray full strength or dilute with water, down to 4% solution. Agitate. Reacts immediately.
Dosage	Dispersant to oil ratio 1:1 to 1:12 by volume.
Use Limitations	Use on light and heavy distillate, residual and crude oils at all temperatures.
REMARKS	Manufacturer reports 100% oil dispersion, at 1:1 ratio with No. 6 oil (20 mls) in 400 ml water, 30 sec. agitation, 1-12 hours standing time.

Spill Experience:

Incident

Used on several small spills in New England. It is the prescribed and inventoried chemical along the St. Lawrence Seaway. Approved for use in reservoir for potable water supply by Dept. of Health in Massachusetts in 1967. Used on Bunker C oil spill at Gulf Oil Co., Philadelphia, Pennsylvania in January 1970. Product was not effective after trying three times to disperse oil. Air temperature was 20° F, water temperature approximately 35° F. The dispersant seemed to remain on top of oil slick with no emulsification after fire hose agitation. Dispersant had to be warmed prior to use[27].

Toxicity Tests:

Species				Ref.
Fathead minnow (Pimephales promelas)	96 hr TL_m	25.0	ppm	(15)
" " " " w/oil	96 hr TL_m	42.0	ppm	"
Mummichog (Fundulus heteroclitus)	24 hr TL_m	110	mg/l	(13)
" " "	96 hr TL_m	32	mg/l	"
Fathead minnow (Pimephales promelas)	96 hr TL_m	50	ppm	(14)
Softshell clam (Mya arenia)	96 hr TL_m	50	ppm	(33)
Mummichog (Fundulus heteroclitus)	96 hr TL_m	44	ppm	"
Winter flounder (Psuedo pluronectus)*	96 hr TL_m	20	ppm	"
Lobster (Homarus americana)	96 hr TL_m	46	ppm	"
Edible mussel (Mytilus edulis)*	96 hr TL_m	40	ppm	"
Atlantic Silversides	96 hr TL_m	25	ppm	"

*tentative subject to revision

MANUFACTURER	Crain Industrial Products Corp. P. O. Box 34223 Farmers Branch, Texas
COST	$2.45 - $2.95/gal.
AVAILABILITY	F.O.B. Farmers Branch, Texas
PRODUCT DESCRIPTION	Anionic
SPECIFIC GRAVITY	Density 8.5 lbs/gal.
FLASH POINT	Non-flammable
SOLUBILITY	Soluble in water
HUMAN HAZARD	Non-toxic

MANUFACTURER'S USE RECOMMENDATIONS

Application Method	Spray under pressure through small nozzle diluted 3 times with water. Contact time 20-30 minutes. For heavy oils apply undiluted.
Dosage	Dispersant to oil ratio 1:6 by volume
REMARKS	Union Oil Co. reported 1:3 or 1:4 dispersant to oil ratio produced light emulsion which was stable 48 hours[14].

Toxicity Tests:

Species		Ref.
Fundulus parvipinnis	96 hr TL_m 115 ppm	(18)
Mummichog (Fundulus heteroclitus)	24 hr TL_m 55 mg/l	(13)
" " "	96 hr TL_m 54 mg/l	"

OIL SPILL ERADICATOR X-1-11

MANUFACTURER	Xzit Chemical Company 56 Newark Street Hoboken, New Jersey 07030
COST	$3.30 - $3.81/gal.
AVAILABILITY	F.O.B. Hoboken, New Jersey
SPECIFIC GRAVITY	0.980 @ 68° F
FLASH POINT	None (C.O.C.)
VISCOSITY	150 cp (Room Temp.)
SOLUBILITY	Insoluble in water
SHELF LIFE	Unlimited
OTHER	Store @ 50° F to 122° F

MANUFACTURER'S USE RECOMMENDATIONS

Application Method	Spray undiluted 10 to 50 times with water. Contact time - 30 minutes.
Dosage	Dispersant to oil ratio 1:10 to 1:50 by volume.
Use Limitations	Minimum temperature for use 50° F. Use on light and heavy distillate residual and crude oils. Recommended for beach cleaning.

Spill Experience:
Incident

No. 5 Fuel Oil cleaned from Bermuda Beach near Princess Hotel. Manufacturer reported all oil was dispersed and the beach sand completely cleaned.

Toxicity Tests:

Species		Reference
Salmon	40% dead 96 hrs 20 ppm	(23)
Herring	10% dead 120 hrs 5 ppm	"
	60% dead 120 hrs 10 ppm	"

NOTE: In this study conducted by Fisheries Research board of Canada the above toxicity data is for XZIT which may be Oil Spill Eradicator X-1-11.

REFERENCE (14)

(PETROLITE) W-1439
(TRET-O-LITE)

MANUFACTURER	Petrolite Corporation Tretolite Division 369 Marshall Avenue St. Louis, Missouri 63119 also 2 West 4th Street New York, New York 10017
COST	$2.90/gal.
AVAILABILITY	F.O.B. St. Louis, Missouri and Brea, California. Distribution points: New Orleans, Louisiana; Houston, Texas; and Philadelphia, Pennsylvania.
PRODUCT DESCRIPTION	Tank cleaner. Contains acylamide, 44%; water, 26%; dipropylene alcohol, 10%; isopropanol, 20%.
SPECIFIC GRAVITY	0.976 @ 21° C
FLASH POINT	94° F (open cup)
VISCOSITY	77 SSU @ 100° F
SOLUBILITY	Soluble in water
SHELF LIFE	Unlimited
OTHER	Pour point > 10° F
HUMAN HAZARD	Non-toxic

MANUFACTURER'S USE RECOMMENDATIONS

Application Method	Spray diluted 1 to 4 times with water by volume. May also be used undiluted. Agitate. Reacts immediately.
Dosage	Dispersant to oil ratio 1:5 to 1:10 by volume.
Use Limitations	Primarily for tank cleaning[10]. Recommended for light and heavy distillate, residual and crude oils.
REMARKS	Manufacturer reports approximately 100% of oil dispersed by laboratory tests. Laboratory tests rated W-1439 as 2 on a scale of 1 (high) to 4 (low). Visual observations used for

comparison with 10 other dispersants. Tested against medium weight crude oil (A.P.I. Gravity 29.9°)(14).

Toxicity Tests:

Species			Ref.
Steelhead minnow fingerlings	96 TL_m	35.5 mg/l	(6)
Zebra fish (Brachydanio rerio)	0 of 4 survived 24 hrs @	10 ppm	(12)
Pacific oyster larvae (Crassotrea gigas)	Toxic conc.	1.5 mg/l	(6)
	Non-toxic conc.	0.8 mg/l	"

(PETROLITE) WF-30

MANUFACTURER	Petrolite Corporation Tretolite Division 369 Marshall Avenue St. Louis, Missouri 63119
COST	$2.00/gal. - 55 gal. drum
AVAILABILITY	F.O.B. St. Louis, Missouri and Brea, California.
PRODUCT DESCRIPTION	50% Aryl sulfonate - 50% aromatic solvent
SPECIFIC GRAVITY	0.94 @ 75° F
FLASH POINT	136° F (open cup)
VISCOSITY	74.7 SSU @ 100° F
SOLUBILITY	Dispersible in water
SHELF LIFE	Unlimited
OTHER	Store @ 40° to 120° F
HUMAN HAZARD	Avoid skin contact

MANUFACTURER'S USE RECOMMENDATIONS

Application Method	Spray - followed by agitation. Contact time - variable, depending on age of oil.
Dosage	Dispersant to oil ratio 1:5 to 1:20 by volume.
Use Limitations	Recommended for use on light and heavy distillates, residuals and crude oils.

POLYCLENS (MOLTOKLAR)*

MANUFACTURER	Polycell Products, Ltd. Broadwater Road Welwyn Garden City Hertfordshire, United Kingdom also Cadix, Great Britain Ltd. and Cadix-Natre of Antwerp
COST	$0.67 to $1.09/gal.
AVAILABILITY	England
PRODUCT DESCRIPTION	Paint brush cleaner. Contains polyglycols, 10%; petroleum naptha, 90%.
SPECIFIC GRAVITY	0.87 @ 50° F
FLASH POINT	116° F to 120° F (A.C.C.)
SOLUBILITY	Emulsifies in water
OTHER	Store below 104° F

MANUFACTURER'S USE RECOMMENDATIONS

Application Method	Spray undiluted
Dosage	Dispersant to oil ratio 1:2 to 1:4 by volume.
Use Limitations	Effective on oils with viscosity <6000 secs.
REMARKS	Manufacturer reports 100% emulsification of oil. At 1:10 ratio emulsified 54% HD-SAE 20 motor oil[1].

*In Germany, Polyclens is known as Moltoklar (Marine Engineer, p. 474, January 1961 (U.K.)

Spill Experience:

Incident

"Esso Portsmouth" - Milford Haven, U. K. (1961)

Anne Mildred Brøvig, North Sea (February 1966)[8]

Effectiveness not reported on the two above incidents.

Toxicity Tests:

Species		Reference
Pink shrimp (*Pandalus montagui*)	48 hr TL_m 8.5 ppm	(3)
Brown shrimp (*Crangon crangon*)	48 hr TL_m 15.7 ppm	"
Shore crabs (*Carcinus maenas*)	48 hr TL_m 23.2 ppm	"
Cockles (*Cardium edule*)	48 hr TL_m 70.0 ppm	"

POLYCOMPLEX A-11 AND A 11 D*

MANUFACTURER	Guardian Chemical Corp. 41-45 Crescent Street Long Island City, New York 11101
	Sole International Distributor: Ocean-Wide Marine Supply Co. Box 827 Huntington, New York 11743
COST	$3.75/gal. $3.80/gal. plus $14.00/dr. on west coast
AVAILABILITY	F.O.B. Long Island City, New York. Inventory at Santa Barbara, Gulf Coast, Boston, Chicago and Miami.
PRODUCT DESCRIPTION	A water-based nonionic oil complexing blend of alkanolamides. Also described as amino-amido complex with 52% water.
SPECIFIC GRAVITY	1.005
FLASH POINT	370° F (O.C.) Auto-ignition temp. 400° F
VISCOSITY	150-160 cp at room temp.
SOLUBILITY	Soluble in water
SHELF LIFE	Unlimited
OTHER	May freeze below 32° F. pH 9.5 - 9.8. Boiling point: 370° F.
HUMAN HAZARD	None to operators. Threshold limit 500 ppm plus.

MANUFACTURER'S USE RECOMMENDATIONS

Application Method	Spray diluted 4 times with sea water at 60-100 psi. Agitate after 3 to 5 minutes reaction time.
Dosage	Dispersant to oil ratio 1:7 to 1:12 by volume. More required for heavy oils.
Use Limitations	Most effective with #2 to #5 fuel oils, but is not effective for Bunker C.

*Polycomplex A-11 is a water solution of Polycomplex A. A-11 contains 47-49% of active agents - 51-53% water. A-11 D contains 33% of active agents - 67% water.

REMARKS

Manufacturer reports all visible oil dispersed.

Sun Oil Co., Philadelphia, reports 1:8 ratio effective for crude and fuel oils.

Gulf Oil Co. reports 1:10 ratio effective.

Spill Experience:

Incident

Ocean Eagle, San Juan, Puerto Rico, March 1968 - Ineffective

Santa Barbara, Union Oil Co. (247 bbls. used) February-March 1969 - Not determined.

Toxicity Tests:

Species

See attached sheets

SUMMARY OF TOXICITY TESTS ON POLYCOMPLEX A-11

Test Organism	Reported As	Concentration	Reference
Mummichog (*Fundulus heteroclitus*)	24 hr TL_m	40 mg/l	(13)
	96 hr TL_m	40 mg/l	
Fathead minnow (*Pimephales promelas*)	96 hr TL_m	13.0 ppm	(17)
Steelhead minnow (*Fingerling*)	96 hr TL_m	13.0 ppm	(6)
Fundulus parvipinnis	24 hr TL_m	225	(18)
	96 hr TL_m	134	
Zebra fish (*Brachydanio rerio*)	24 hr (none of 5 survived)	30 ppm	(17)
Moharra (*Eucinostomus argenteus*)	18 hr TL_0	5 ppm	(20)
	6 hr TL_{33}	10 ppm	"
	12 hr TL_{100}	27 ppm	"
	6 hr TL_{100}	100 ppm	"
Silversides (*Artherinomorus stipes*)	18 hr TL_{100}	5 ppm	"
	12 hr TL_{33}	10 ppm	"
	6 hr TL_{100}	100 ppm	"
Herring (*Harengula clupeola*)	75% showed loss of balance @	5 ppm	"
Sergeant major (*Abudefduf saxatilis*)	18 hr TL_0	5 ppm	"
Brine shrimp (*Artemia salina*) With Navy #4 fuel (diesel) oil	72 hr TL_{100}	100 ppm	(21)
	8 hr TL_{100}	500 ppm	"

SUMMARY OF TOXICITY TESTS ON POLYCOMPLEX A-11 (Cont'd)

Test Organism			Reference
Killifish (*Fundulus diaphanus*)	All affected in	20 hrs @ 100 ppm	(21)
Killifish (*Fundulus heteroclitus*)	None of 5 survived	18 hrs @ 33 mg/l	(22)
Marine fish (*Gambusia*)	12 of 22 dead in	24 hrs @ 15 ppm	(23)
	None of 21 surved	24 hrs @ 30 ppm	"
Clams (*Mercinaria mercinaria*)	When tested at 0, 83, 107, 335, 670 and 1005 mg/l, the following was observed: At the 0.0 control concentration, various numbers of clams were observed pumping and no deaths occurred. Only once at the lowest concentration (83 mg/l) was one clam observed not pumping. At 48 hours, deaths started to occur; with several clams dying at the three highest concentrations. This is meaningful as clams can or are supposed to stay alive in a bactile environment for weeks at a time.		(22)
Commercial oyster	The oysters were exposed to Polycomplex and Navy #4 Fuel Oil at 1:9 ratios in a flowing seawater system for 96 hours with the following results: @ 400 ppm - shell growth decreased 99% (approx.) @ 200 ppm - " " " 65% @ 100 ppm - " " " 65% @ 50 ppm - " " " 50% When placed in clean flowing seawater after testing, all oysters, at all concentrations tested, recovered.		(21)

RIDZLIK

MANUFACTURER	Ashland Chemicals Industrial Chemicals & Solvents Division 8 East Long Street Box 2219 Columbus, Ohio 43216
COST	$1.50/gal. - 55 gal. drum
AVAILABILITY	F.O.B. 50 locations in U. S.
PRODUCT DESCRIPTION	Contains a highly concentrated water-based surfactant.
SPECIFIC GRAVITY	0.9799 @ 60° F
FLASH POINT	95° F (T.O.C.)
VISCOSITY	3.99 cs @ 100° F
SOLUBILITY	39.1 SUS @ 100° F
SHELF LIFE	Stable for long periods in proper containers.
OTHER	Pour point 0° F Freeze point 0° F Store above 0° F
HUMAN HAZARD	Very low

MANUFACTURER'S USE RECOMMENDATIONS

Application Method	Sprayed or sprinkled. Educted at rate of 1 quart per 100 gals. of water for large slicks. Can be used with fire fighting foam eductors.
Use Limitations	Recommended for distillate and crude oils. Not specifically recommended for use on Bunker C. Minimum water temperature of 10° F.

Toxicity Tests: Species		Reference
Opal eyed perch (Girella nigracans)	72 hr TL_m 34.4 ppm	(25)
	Average 24-72 hr TL_m 36.4 ppm	"

SEAMULSO E

MANUFACTURER	Turco Chemische Producten N.V. Verl. Blokkenweg 12 Ede, Holland
COST	$2.17/gal. in Holland
PRODUCT DESCRIPTION	Aromatic diluent - 70%
SPECIFIC GRAVITY	0.94
FLASH POINT	151° F P.M.
VISCOSITY	5 cp @ 25° C
SOLUBILITY	Emulsifiable in water
SHELF LIFE	Unlimited
HUMAN HAZARD	Threshold limit of 250 ppm

MANUFACTURER'S USE RECOMMENDATIONS

Application Method	Spray undiluted. Contact time 15 to 30 minutes before agitation.
Dosage	About 2.5 to 12.5 gal/100 ft^2 of surface.
Use Limitations	For use on light and heavy distillate, residual and crude oil.
REMARKS	Manufacturer reports product will completely emulsify in time all oil and tar.

REFERENCE (14)

SKANEX S-102

MANUFACTURER	Scandinavian Oil Service Stora Badhusgatan 20 S-41121 Gothenburg, Sweden
	Domestic Representative:
	Surface Separator Systems, Inc. 103 Mellor Avenue Baltimore, Maryland 21228
COST	$3.64/gal. (1-55 gal. drum)
AVAILABILITY	F.O.B. Gothenburg, Sweden
PRODUCT DESCRIPTION	Polyglycolethers (3), 10%; naptha diluent, 90% (includes aromatics (maximum), 20%)
SPECIFIC GRAVITY	0.79
FLASH POINT	153° F (P.M.)
SOLUBILITY	Emulsifies in water
SHELF LIFE	Unlimited
HUMAN HAZARD	Avoid eye and skin contact.

MANUFACTURER'S USE RECOMMENDATIONS

Application Method	Spray. Agitate. Reacts immediately.
Dosage	Dispersant to oil ratio 1:2 to 1:10 by volume.
Use Limitations	For use on light and heavy distillate, residual and crude oils at temperatures greater than 38° F in salt water (not fresh water).
REMARKS	Used by Swedish Coast Guard to control several spills. Effectiveness not reported.

SLIX

MANUFACTURER	Amerace-Esna Corp. Chemical Specialties Division 74 Hudson Avenue Tenafly, New Jersey 07670
COST	$2.85 - $3.07/gal. (1-55 gal. drum)
AVAILABILITY	F.O.B. Tenafly, New Jersey and Los Angeles, California
PRODUCT DESCRIPTION	Blend of nonionic and anionic surfactants, 33.8%; alkaline silicate, 3%[25]; 10-15% silicates and hydrotropes[5]. Also, nonionic alkyl-phenoxy ethoxy-ethanol, 45% with water diluent[14].
SPECIFIC GRAVITY	1.046 @ 65° F
FLASH POINT	Does not burn
SOLUBILITY	Soluble in water
SHELF LIFE	Unlimited
OTHER	pH 11.5. Keep from freezing.
HUMAN HAZARD	Possible dermatitis from prolonged contact.

MANUFACTURER'S USE RECOMMENDATIONS

Application Method	Spray diluted 1 to 4 times with sea water. For eduction dilute 19 to 32 times.
Dosage	Dispersant to oil ratio 1:20 by volume, with greater ratio for thin slicks. Use 1 gal/100 ft^2.
Use Limitations	For use on light and heavy distillate, residual and crude oils at temperatures between 50° to 80° F. Not for use on shores.
REMARKS	Manufacturer reports 100% of oil emulsified - most efficient conditions. Dispersant to oil ratio 1:10 gave 70% emulsification of HD-SAE 20 motor oil[17].
NOTE	Available in England from: Safety Cleaning Solvents Ltd. P. O. Box 10 Egham, Surrey, England[11]

Spill Experience:

Incident

Anne Mildred Brøvig, Feb. 1966[8], North Sea - crude oil

Albacape, 1966, New York Harbor - 2,000 gallons used

Effectiveness not determined on the two above incidents.

Toxicity Tests:

Species			Reference
Pink shrimp (Pandulus montagui)	48 hrs TL_m	12.1 ppm	(3)
Brown shrimp (Crangon crangon)	48 hrs TL_m	114.5 ppm	"
Shore crabs (Carcinus maenas)	48 hrs TL_m	> 150 ppm	"
Cockles (Cardium edule)	48 hrs TL_m	12.7 ppm	(13)
Mummichog (Fundulus heteroclitus)	24 hrs TL_m	16 mg/l	"
Zebra fish (Brachydanio rerio)	No survival @	10 ppm	(12)
Bluegill	96 hrs TL_m	10.5 ppm	(33)
Yellow Peach	96 hrs TL_m	3.2 ppm	"

SPILL-X

MANUFACTURER	Pacific Chemical 4501 Shilshole N.W. Seattle, Washington 98107
COST	$3.45/gal. (1-55 gal. drum)
AVAILABILITY	F.O.B. Seattle, Washington
PRODUCT DESCRIPTION	Primarily a degreaser
SPECIFIC GRAVITY	0.914 - 0.92 @ 68° F
FLASH POINT	220° F (C.O.C.)
SHELF LIFE	Two years
OTHER	Store @ 0° - 120° F

MANUFACTURER'S USE RECOMMENDATIONS

Application Method	Spray undiluted. Agitate.
Dosage	Varies with conditions
Use Limitations	For use on light and heavy distillate, residual, and crude oil at any temperature.
REMARKS	Rated 2 on lab test and 1 on field tests on a scale of 1 (low) to 4 (high). Tested visually against 10 other dispersants. Medium weight crude oil used (A.P.I. Gravity 29.9°)[17].
OTHER	At 1:1 ratio 41.1% of Navy Special Fuel oil emulsified[9].

SURFLO RD 282

MANUFACTURER	National Lead Company Baroid Division P. O. Box 1675 Houston, Texas 77002
COST	$3.25/gal.
AVAILABILITY	F.O.B. Houston, Texas
PRODUCT DESCRIPTION	Oxyalkylated ester, 40%; oxyalkylated alcohol, 10%; esters, 2.5%; water diluent, 37.5%; alcohol dilutent, 10%.
SPECIFIC GRAVITY	0.997 A 65° F
FLASH POINT	168° F (T.O.C.)
VISCOSITY	275 SSU @ 70° F
SOLUBILITY	Soluble in water
SHELF LIFE	Unlimited
OTHER	Store @ -10° F to 150° F
HUMAN HAZARD	Contact is not hazardous unless specific allergies develop. Contains no known chemicals known to be particularly toxic by inhalation.

MANUFACTURER'S USE RECOMMENDATIONS

Application Method	Spray undiluted. Dilute 19 to 400 times with water for larger slicks.
Dosage	Dispersant to oil ratio 1:10 to 1:100 by volume.
Use Limitations	Recommended for light and heavy distillate, residual and crude oils. Not recommended for use in potable water supplies.
REMARKS	Manufacturer reports 1 ml keeps 10 mls of oil dispersed in 90 mls of sea water for 24 hours.

Toxicity Tests: Species		Reference
Black mollies	No Kill, 24 hrs @ 100 ppm	(14)

Spill Experience:

Incident

Lake Union, Seattle, Washington - spill by Washington Natural Gas Co.[14]

Willamette River, Portland, Oregon - several spills cleaned up by Shaver Transportation, Portland, Oregon[14].

Sitka Harbor, Alaska - used on spill on harbor and on beaches[14].

Puget Sound, Bremerton, Washington - several spills by Puget Sound Navy Yard[14]

Toxicity Tests:

Species			Reference
Steelhead minnow fingerlings	96 hr TL_m	35.5 ppm	(6)
Pacific oyster larvae (Crassotrea gigas)	Toxic	1.5 ppm	"
	Non-toxic	0.4 ppm	"

TALENT

MANUFACTURER	Wyandotte Chemicals Corp. J. B. Ford Division Wyandotte, Michigan 48192
COST	$3.15/gal.
AVAILABILITY	Manufactured at five plants in the United States and Canada
PRODUCT DESCRIPTION	Heavy duty liquid syndet for use with sea water. Contains nonionic detergents and water diluent.
SPECIFIC GRAVITY	1.03
FLASH POINT	200° F (P.M.C.C.)
VISCOSITY	5.0 cp @ 68° F
SOLUBILITY	Miscible with water
SHELF LIFE	Unlimited
OTHER	Store @ 0° to 140° F
HUMAN HAZARD	Non-toxic to operators

MANUFACTURER'S USE RECOMMENDATIONS

Application Method	Spray undiluted. Agitate. Reacts immediately.
Dosage	Dispersant to oil ratio 1:1 to 1:40 by volume, depending on viscosity of oil.
Use Limitations	Recommended for small spills of distillate fuel or other light oils.
REMARKS	In lab test at a 1:1 ratio, emulsified 16.3% of Navy special fuel oil[9].

Toxicity Tests: Species		Reference
Goldfish	TL_m 45 ppm	(14)

TEOC 444

MANUFACTURER	Teoc, Inc. P. O. Box 513 1100 Victory Drive Westwago, Louisiana 70094
COST	$3.30/gal. in ten drum lots
AVAILABILITY	F.O.B. Westwago, Louisiana
PRODUCT DESCRIPTION	Nonionic surfactants and aliphatic solvent.
SPECIFIC GRAVITY	0.846 @ 75° F
FLASH POINT	104° F (T.C.C.)
SOLUBILITY	Complete dispersion in water
OTHER	Store @ less than 212° F
HUMAN HAZARD	Threshold limit value of 500 ppm for inhalation.

MANUFACTURER'S USE RECOMMENDATIONS

Application Method	Spray undiluted. Dilute 3 times with water for plane spraying or in strong winds.
Dosage	Dispersant to oil ratio of 1:10 for average light crudes found in South Louisiana.
Use Limitations	Contact time varies. The finer the spray, the more effective will be application. Recommended for use on Bunker C and fresh crude oil.
REMARKS	Manufacturer reports 100% effectiveness. The heavier the oil the poorer is the effectiveness. "Dead" oil or old pit oil may not be dispersed.

REFERENCE (14)

TEOC 777

MANUFACTURER	Teoc, Inc. P. O. Box 513 1100 Victory Drive Westwago, Louisiana 70094
COST	$3.30/gal. in ten drum lots
AVAILABILITY	F.O.B. Westwago, Louisiana
PRODUCT DESCRIPTION	Nonionic 37.3% aliphatic diluent - 62.7%
SPECIFIC GRAVITY	0.837 @ 75° F
FLASH POINT	104° F (T.C.C.)
SOLUBILITY	Complete dispersion in water
OTHER	Store @ less than 212° F
HUMAN HAZARD	Threshold limit value 500 ppm for inhalation

MANUFACTURER'S USE RECOMMENDATIONS

Application Method	Spray undiluted. For plane spraying or application in strong winds dilute 1:3 by volume with water.
Dosage	Dispersant to oil ratio 1:20 by volume, but varies with changing conditions.
Use Limitations	Contact time varies. The finer the spray the more effective will be the application. Recommended for use on Bunker C and fresh crude oil.
REMARKS	Manufacturer reports 100% effectiveness. The heavier the oil, the poorer is the effectiveness. "Dead" oil or old pit oil may not be dispersed.

REFERENCE (14)

TYFOSOL 80

MANUFACTURER	National Research and Chemical Company 1250 Cerise Avenue Hawthorne, California 90250 also 30 East 42nd Street New York, New York 10001
COST	$5.00/gal. in five drum lots
PRODUCT DESCRIPTION	Polyglycols, 6%; amines, 11%; nonionics, 40%. Also described as a blend of amineamido sulphonates and alkanolamide-type detergents.
SPECIFIC GRAVITY	0.945 @ 20° F
FLASH POINT	150° F (C.O.C.)
SOLUBILITY	Emulsifies in water
SHELF LIFE	One year or more
HUMAN HAZARD	Non-toxic to personnel.

MANUFACTURER'S USE RECOMMENDATIONS

Application Method	Spray undiluted
Dosage	Dispersant to oil ratio of 1:33 to 1:50 by volume should emulsify Bunker C.
Use Limitations	Recommended for use on light and heavy distillate, residual, and crude oils.
REMARKS	Passes MIL-C-22230 tests

Toxicity Tests: Species		Reference
Mummichog (Fundulus heteroclitus)	24 hr TL_m 13.5 mg/l	(13)
	96 hr TL_m 13.5 mg/l	"

(WYANDOTTE) SPILL REMOVER*

MANUFACTURER	Wyandotte Chemicals Corporation J. B. Ford Division Wyandotte, Michigan 48192
COST	$2.55/gal. (1-55 gal. drum)
AVAILABILITY	F.O.B. Los Angeles, California; Stroudsburg, Pennsylvania; Atlanta, Georgia; Wyandotte, Michigan; and Venezuela
PRODUCT DESCRIPTION	Polyglycols, 33%; and aromatic solvents
SPECIFIC GRAVITY	0.9
FLASH POINT	160° F (T.C.C.)
VISCOSITY	5.5 cps @ 68° F
SOLUBILITY	Emulsifies in water
SHELF LIFE	Unlimited
OTHER	Store @ 0° F to 140° F. 5-day BOD @ 20° C 630,000 mg/l[15]
HUMAN HAZARD	Relatively non-toxic

MANUFACTURER'S USE RECOMMENDATIONS

Application Method	Sprinkle or spray undiluted in a solid stream using a low pressure nozzle. Agitate. Contact time, 3 to 20 minutes for heavy fuel oils and crude. Atomizing or fogging nozzles not recommended.
Dosage	Dispersant to oil ratio 1:5 by volume. For Bunker C or Navy Special 1:3 by volume.
Use Limitations	Use on light and heavy distillate, residual and crude oils in both fresh and sea water.
REMARKS	Manufacturer reports product passes requirements of MIL-S-22864-A (Ships). Disperses approximately 5 times its weight in oil. Dispersant to oil ratio of 1:10 emulsified 70% of HD-SAE 20 motor oil[1].

*Same or similar to Casol except flash point[25].

Toxicity Tests:

Species				Reference
Fathead minnow (Pimephales promelas)	96 hr	TL_m	5.6 ppm	(15)
Goldfish (Estimated)		TL_m	15 ppm	(14)

SECTION B

The following dispersant products are listed in Section B:

ACTUSOL

ACTUSOL T-776

AFCO #5350

ACTEMUL

ACTEMUL U.C.

AMEROID DREWCLEAN 522

AMWAY INDUSTROCLEAN

ANTI-OIL TS 3

ANTI-OIL TS 5

AQUANIX

AQUATREAT

ASCAL SUPER 7-11

ATLAS 1901

AUTOMATIC TANK WASH

BAROID SLIX-5

BASIC-H

BASAL AD 6

BD-30

BERGEN

BIG RED

CESCO

CEJER APC

CIRRASOL

CHEVRON NI-O

CLEANOSOL

CLEANER - 8671

CLOCK 06:39

COB

COLDCLEAN

COMPOUND RICHONAGE YLA

CONCO EMULSIFIER 700

CON-O-1571

C-REINIGER

CRONAX (OIL SPILL)

CW SOLVENT

DART DBC PLUS

DECK GLO

DEGREASER 80 G

DEGRECO

DERMOL

D.G. 04

DI-CHEM 322

DI-CHEM 325

DI-CHEM 400

DISPERSITE 110

DISPERSAL

DISOLVOL

DISSOLVO

DREW SC 96

DREW TANK CLEANER NO. 4

DUNHAM D-166

ELIMAX

EMSOL

ESSO F-6155

EMULSIFIER K

E-147 (SHANNON)

E-314

FASOLV

FINA SOL

FINA TAR SOLVENT

FINA TAR SOLVENT E.S.

FINA-UNISOL

F.O. 399

GREESKILLA 3

GULF AGENT 822

GULFSIL DE-GREASER

HAMCO

HEPACOLITH

HOUGHTOSAFE 112

HOUGHTOSOLV

HOUGHTON-DETERGENT

HYDRO-GAMMASOL

H-4000

ICI SURFACTANT

IMC-SWS

IGEPAL RC 520

JAY

KLEARFAC AA040

KLEARFAC AA270

KLEARFAC AA-420

KLEARFAC AB270

KELITE A-108-1

KILL-SPILL-D-166

KOR-14

K-RITE 300

KURI-CLEAN "SD"

LIX 336

LIQUID CONCENTRATE

LISSAPOL N.X.

MABEC-PPS

MABEC-21T

MAGNA

MAGNUS MARINE DISPERSER

MARINE CLEANER 8551

MARINE CLEANER 8555

MARITEC OIL SPILL REMOVER

METCLENE SPECIAL

METCLENE

METSPERE

MIGHTY MATE

MILCHEN MIL-EMULSIFIER

MILCHEN PPS

MUROL-OSE #2

NAVEE 42

NAVITONE

NEOS AB

NORSEMEN 67

NORSEMEN 69

NYSTOL O.S.E. #79

OIL & GREASE REMOVER

OIL & GREASE REMOVER

OIL AND SPILL ERADICATOR

OIL EX

OIL GO

OIL MEGA

OIL SLICK EMULSIFIER #5189

OIL SPILL

OIL SPILL DISPERSER

OIL SPILL REMOVER #1

OIL SPILL REMOVER #2

OSR-7348

OXANE

OXANEEZ

PARDAG HEAVY DUTY

PENTRON-D

PENTRON TC-30

PERMAG #41

PERO-KLEAN No. 801

PERO-KLEAN No. 805

PERO-KLEAN No. 818

PETRO-BAN

PILOT OIL SPILL ERADICATOR

P.O. 576

POLY-ZYME

PRODUCT 20215

RETZLOFF 1-4016-P

S-1

S-5

SANTOMERSE ME-B

SLURRY

SEA CLEAN 70

SEA GREEN 50 A

SEA GREEN 70

SEA SWEEP

SELF RINSE

SEPTEX

SHIP CLEAN

SILLARIT

SKANEX QUICK

SLICKAWAY

SLIPCLEAN

SLICKGONE I

SLICKGONE #2

SNOWDRIFT

SP 162

STREP 33

STRUKTOL

SURFACTANT 8851

SURFEMUL #5

SWABY

TANK-GLO

TCC-569 (Crain)

TEEPOL

TERGITOL 15-S-5

TERGITOL 15-S-9

TIP TOP CLEANER

TRACER-TECK

TRET-O-LITE

TRICON

TUROO

(TWELVE) 12 N DEGREASER

UNICO CONCENTRATE

UNISOL-FE

VECOM B-24

VISCO C-16-F

WEN-DON FORMULA 203

WHITTAKERS G.P. DEGREASANT

WYANDOTTE 20

ZIF

ACTEMUL

MANUFACTURER	Aetna Chemical Corp. Power Division East Paterson, New Jersey 07407
PRODUCT DESCRIPTION	Heavy-duty degreaser. Emulsifiers, wetting agents and solvents which are 99% aromatic.
COST	$2.25/gal.
SPECIFIC GRAVITY	0.9639 @ 60° F
FLASH POINT	195° F (C.O.C.)
FIRE POINT	210° F (C.O.C.)
SOLUBILITY	Soluble in water
OTHER	pH 8.0
POUR POINT	-30° F
APPLICATION METHOD	Spray full strength or dilute 1 to 10 times with water.

ACTEMUL U.C.

MANUFACTURER	Aetna Chemical Corp.
PRODUCT DESCRIPTION	All-purpose degreaser. Nonionic - petroleum solvent and detergents.
COST	$2.25/gal.
SPECIFIC GRAVITY	0.9639 @ 60° F
FLASH POINT	None (C.O.C.)
POUR POINT	5° F
FIRE POINT	None (C.O.C.)
BOILING POINT	95° C
HUMAN HAZARD	Avoid prolonged contact

ACTUSOL

MANUFACTURER — W. R. Grace & Co.
Du Bois Chemical Division
Union Avenue & Du Bois
East Rutherford, New Jersey 07070

PRODUCT DESCRIPTION — Contains vegetable oil soap, alkali and aliphatic solvent.

SPECIFIC GRAVITY — 0.895 - 0.905

FLASH POINT — 135° F (C.O.C.)

REFERENCE (25)

ACTUSOL T-776

MANUFACTURER — W. R. Grace & Co.

COST — $2.50/gal.(10)

PRODUCT DESCRIPTION — Nonionic surfactant, petroleum sulfonate, pine oil, cyclohexanol, and aliphatic solvent.

SPECIFIC GRAVITY — (Bulk density) 8.25 lb/gal.

FLASH POINT — 135° F

Toxicity Tests:

Species		Ref.
Steelhead minnow fingerling	96 hr TL_m 24.0 ppm	(6)

AFCO #5350*

MANUFACTURER — Alex C. Ferguson Co., Inc.
Philadelphia, Pennsylvania 19104

COST — $2.40/gal.

REFERENCE (5)(26)(28)

*Also called AFCO OIL SPILL ERADICATOR

AMEROID DREWCLEAN 522

MANUFACTURER	Drew Chemical Corp.
PRODUCT DESCRIPTION	Degreaser. Contains emulsifiers, wetting agent and solvent with weak aromatic odor.
SPECIFIC GRAVITY	0.920 @ 20° C
FLASH POINT	168° F
CLOUD POINT	10° F
REFERENCE	(25)

AMWAY INDUSTROCLEAN

MANUFACTURER	Amway Corp. Ada, Michigan 49301
PRODUCT DESCRIPTION	Nonionic with trace of anionic
REFERENCE	(29)

ANTI-OIL TS 3

MANUFACTURER	German Reference (1)

ANTI-OIL TS 5

MANUFACTURER	German Reference (1)
EFFECTIVENESS	At D/O ratio of 1:10 emulsified 68% of HD-SAE 20 motor oil.

AQUANIX

MANUFACTURER	Milchen, Inc. Box 2211 Houston, Texas 77001

AQUATREAT

MANUFACTURER: Carter Chemical Co.
250 Fulton Avenue
Hempstead, New York 11550

PRODUCT DESCRIPTION: Physical and chemical characteristics identical to Polycomplex.

REFERENCE (25)

ASCAL SUPER 7-11

MANUFACTURER: German Reference

SPILL EXPERIENCE: Used during Anne Mildred Brøvig Tanker incident in North Sea.

REFERENCE (1)(8)(26)

ATLAS 1901

MANUFACTURER: Atlas Preservative Co., Ltd.
Fraser Road
Erith, Kent, England

COST: $1.60/gal.

PRODUCT DESCRIPTION: Solvent based

DOSAGE: Dispersant to oil ratio 1:4 by volume

Toxicity Tests:

Species			Ref.
Pink shrimp (Pandalus montagui)	48 hr TL_m	87 ppm	(3)
Brown shrimp (Crangon crangon)	48 hr TL_m	120 ppm	"
Shore crabs (Carcinus maenas)	48 hr TL_m	> 150 ppm	"
Cockles (Cardium edule)	48 hr TL_m	48 ppm	"

REFERENCE (3)(26)

AUTOMATIC TANK WASH

MANUFACTURER: Magnus Chemical Co.

EFFECTIVENESS: In lab test @ D/O ratio 1:1 emulsified 14% of Navy Special grade fuel oil.

REFERENCE (16)

BAROID SLIX-5 DEGREASER

MANUFACTURER National Lead Co.

PRODUCT DESCRIPTION Contains glycol ether, solvents

REFERENCE (26)

BASIC-H

MANUFACTURER Shaklee Products
Hayward, California 94544

PRODUCT DESCRIPTION Nonionic concentrated water-based cleaning compound (not a detergent or soap)

SPECIFIC GRAVITY 1.03

FLASH POINT None

pH 6.5

REFERENCE (25)

BASAL AD 6

REFERENCE (4)(25)(26)

BD-30

MANUFACTURER Rohm & Haas Co.
Independence Mall West
Philadelphia, Pennsylvania 19105

PRODUCT DESCRIPTION Anionic surfactant

BERGEN OIL ON WATER REMOVER

MANUFACTURER Bergen Chemical Corp.
Back Bay
P. O. Box 371
Boston, Massachusetts 02117

REFERENCE (28)

BIG RED

MANUFACTURER — Texas Refinery Corp.
Fort Worth, Texas 76101

Suggested for use at Santa Barbara, California

REFERENCE (25)

CESCO

SPILL EXPERIENCE — Reportedly used in Lake Charles, Louisiana area

REFERENCE (25)

CEJER APC

MANUFACTURER — Cejer Co.
2545 Treedy Blvd.
South Gate, California 90280

Suggested for use at Santa Barbara, California

REFERENCE (25)

CIRRASOL

MANUFACTURER — Imperial Chemical Industries

Toxicity Tests:

Species		Ref.
Shrimp	TL_m 2000 ppm	(25)

CHEVRON NI-O

MANUFACTURER Chevron Chemical Co.
200 Bush Street
San Francisco, California 94101

REFERENCE (6)(26)

Toxicity Tests:

Species			Ref.
Steelhead minnow fingerling	96 hr TL_m	3.2 mg/l	(6)

CLEANOSOL

REFERENCE (3)(12)

Toxicity Tests:

Species			Ref.
Pink shrimp (Pandulus montagui)	48 hr TL_m	32 ppm	(3)
Brown shrimp (Crangon crangon)	48 hr TL_m	44 ppm	"
Shore crabs (Carcinus maenas)	48 hr TL_m	102 ppm	"
Cockles (Cardium edule)	48 hr TL_m	19 ppm	"
Zebra fish (Brachydanio rerio) No survival	24 hr	15 ppm	(12)

CLEANER-8671

MANUFACTURER Enjay Chemical Co.
60 West 49 Street
New York, New York 10020

REFERENCE (12)

Toxicity Tests:

Species			Ref.
Zebra fish (Brachydanio rerio) None survived	24 hr	@ 20 ppm	(12)

CLOCK 06:39

MANUFACTURER Cleaning Compounds Corp.
999 Commercial Street
Palo Alto, California 94302

Suggested for use at Santa Barbara, California

REFERENCE (25)

COE

MANUFACTURER

Enjay Chemical Co.
Houston Chemical Plant
Stedman Street
Houston, Texas 77002

Suggested for use at Santa Barbara, California

REFERENCE (25)

COLD CLEAN

MANUFACTURER

Adair Equipment Co.
405 Century Building
Houston, Texas 77002

Distributor:

Rapid Supply Co. (same address)

PRODUCT DESCRIPTION — Cold water cleaner and oil emulsifier. Low level phosphate emulsifier which contains trisodium nitrilostriacetate.

FLASH POINT — Does not flash (C.O.C.)

BOD — 20-day BOD @ 20° C, 3,200 to 3,600

APPLICATION METHOD — Dilute 100 times with water

Product was used on the Chevron Platform "C" blow-out as a safety precaution to reduce the flamability of the crude after the fire was extinguished.

Toxicity Tests:

Species		
Fathead minnow (*Pimephales promelas*)	96 hr TL_m	138 ppm
Non-toxic (No Kill)	96 hr TL_o	120 ppm
Minnow (*Fundulus simulus*)	96 hr TL_m	220 ppm
Non-toxic (No Kill)	96 hr TL_o	180 ppm
Blue crab (*Callinectes sapidus*)	96 hr TL_m	500 ppm
Non-toxic (No Kill)	96 hr TL_o	450 ppm

REFERENCE (25)

COMPOUND RICHONAGE YLA

MANUFACTURER — Richardson Co.
100 New Street
Paterson, New Jersey 07510

REFERENCE (26)

CONCO EMULSIFIER 700

MANUFACTURER — Continental Chemical Co.
270 Clifton Blvd.
Clifton, New Jersey 07015

PRODUCT DESCRIPTION — Nonionic. 100% blend of surfactants for use in emulsifying low viscosity oils.

SP. GR. — 1.02

REFERENCE (26)

CONCO EMULSIFIER K

MANUFACTURER — Continental Chemical Co.

PRODUCT DESCRIPTION — Basically nonionic with traces anionic, blend of surfactants.

CON-O-1571*

MANUFACTURER — Continental Chemical Co.

EFFECTIVENESS — At 1:1 ratio emulsified 11.2% of Navy Special Grade Fuel Oil.

REFERENCE (26)

*Product no longer available

C-REINIGER

MANUFACTURER — German Reference (1)

EFFECTIVENESS — At D/O ratio 1:10 emulsified 92% HD-SAE 20 motor oil.

CRONAX (OIL SPILL)

MANUFACTURER — Atlas Chemical Industries, Inc.
1270 Avenue of the Americas
New York, New York 10020

REFERENCE (28)

CW SOLVENT

MANUFACTURER — Gamlen Chemical Co.

COST — $1.80/gal.

PRODUCT DESCRIPTION — Tank and bilge cleaning solvent.

EFFECTIVENESS — In lab tests at 1:1 ratio emulsified 15.2% of Navy Special Grade Fuel Oil[9].

Toxicity Tests: Species		Ref.
Pink shrimp (Pandalus montagui)	48 hr TL_m 14.6 mg/l	(3)
Cockles (Cardium edule)	48 hr TL_m 69.5 mg/l	

NOTE: Other company products listed as tank and bilge cleaning solvents are Sea Clean and Sea Clean #2.

DART

MANUFACTURER	Sea-Air Chemical Corp. 3200 Borden Avenue Long Island City, New York 11101
COST	$1.45/gal. (1-55 gal. drum)
AVAILABILITY	F.O.B. Long Island City, New York
PRODUCT DESCRIPTION	Solvent emulsion degreaser for tank cleaning. Polyglycols and solvents. This product is Sea Air Chemical Corp. primary oil spill dispersant.
SPECIFIC GRAVITY	0.89
FLASH POINT	170° F (C.O.C.)
SOLUBILITY	Emulsifies in water
SHELF LIFE	Unlimited

Toxicity Tests: Species			Ref.
Mummichog (Fundulus heteroclitus)	24 hr TL_m	44 mg/l	(13)
	96 hr TL_m	18 mg/l	"

DBC PLUS

MANUFACTURER	Cultured Chemical Division 1139 West Struck Avenue Orange, California 92667 Suggested for use at Santa Barbara, California
REFERENCE	(25)

DECK GLO

MANUFACTURER	Sea Air Chemical Corp.
PRODUCT DESCRIPTION	Nonionic, 65% water. A tank wash.
EFFECTIVENESS	In lab test @ D/O ratio 1:1 emulsified 39.2% of Navy Special Grade Fuel Oil.
SPECIFIC GRAVITY	1.017 @ 80° F
POUR POINT	30° F
REFERENCE	(16)

DEGREASER 80 G

MANUFACTURER The Chemlan Co.
24 Smith Street
Biddleford, Maine 04005

PRODUCT DESCRIPTION Solvent/emulsifier. No. 2 fuel oil as solvent.

REFERENCE (25)

DEGRECO

MANUFACTURER Hampton Roads Chemical Corp.
P. O. Box 1848
Newport News, Virginia 23607

PRODUCT DESCRIPTION Contains emulsifiers in No. 2 fuel oil solvent.

REFERENCE (25)

DERMOL

REFERENCE (3)

Toxicity Tests:

Species		Ref.
Pink shrimp (Pandalus montagui)	48 hr TL_m 148 ppm	(3)
Brown shrimp (Crangon crangon)	48 hr TL_m 156 ppm	"
Shore crabs (Carcinus maenas)	48 hr TL_m 435 ppm	"
Cockles (Cardium edule)	48 hr TL_m 148 ppm	"

D. G. 04

MANUFACTURER Banner Chemical Products Corp.
46 Great Jones
New York, New York 10001

REFERENCE (26)(28)

DI-CHEM 322
DI-CHEM 325
DI-CHEM 400

MANUFACTURER Diversified Chemicals Corp.
8100 Electric Avenue
Stanton, California 90680

REFERENCE (26)

DISPERITE 110

MANUFACTURER O'Brien Industries, Inc.
1040 Bushwick Avenue
Brooklyn, New York 11201

REFERENCE (25)

DISPERSAL

MANUFACTURER Sea Air Chemical Co.

REFERENCE (28)

DISOLVOL

MANUFACTURER Sea Air Chemical Co.

PRODUCT DESCRIPTION Non-solvent emulsifier

SPECIFIC GRAVITY 1.068 @ 80° F

REFERENCE (25)

DISSOLVO

MANUFACTURER Sea Air Chemical Co.

PRODUCT DESCRIPTION Nonionic - 72% water

SPECIFIC GRAVITY 1.068 @ 80° F

EFFECTIVENESS In lab test @ D/O ratio 1:1 emulsified 19% of Navy Special.

REFERENCE (16)

DREW SC 96*

MANUFACTURER Drew Chemical Corp.

EFFECTIVENESS At D/O ratio 1:10 emulsified 66% HD-SAE 20 motor oil.

REFERENCE (1)

*Product no longer available

DREW TANK CLEANER NO. 4

MANUFACTURER Drew Chemical Corp.

REFERENCE (4)

DUNHAM D-166

MANUFACTURER Dunham Chemical Co.
20 Versey Street
New York, New York 10001

REFERENCE (25)

Toxicity Tests:

Species		Ref.
Mummichog (Fundulus heteroclitus)	24 hr TL_m 16 mg/l	(13)
	96 hr TL_m 16 mg/l	"

ELIMAX

MANUFACTURER German Reference (1)

EFFECTIVENESS At D/O ratio of 1:10 emulsified 80% of HD-SAE 20 motor oil.

EMSOL

MANUFACTURER Du Bois Chemical Division

PRODUCT DESCRIPTION Nonionic mineral oil sulfonate

SPECIFIC GRAVITY 0.84

FLASH POINT 135° F (C.O.C.)

REFERENCE (16)

ESSO F-6155

MANUFACTURER Esso Research & Engineering
Linden, New Jersey 07036

Toxicity Tests:

Species			Ref.
Pink shrimp (Pandalus montagui)	48 hr TL_m	8.6 ppm	(3)
Brown shrimp (Crangon crangon)	48 hr TL_m	9.6 ppm	"
Shore crabs (Carcinus maenas)	48 hr TL_m	17.5 ppm	"
Cockles (Cardium edule)	48 hr TL_m	63 ppm	"

EMULSIFIER K

MANUFACTURER Continental Chemical Co.

PRODUCT DESCRIPTION Refer to Conco Emulsifier K

E-147 (SHANNON)

MANUFACTURER Unknown

Suggested for use at Santa Barbara, California

REFERENCE (25)

E-314

MANUFACTURER Du Bois Chemical Division

PRODUCT DESCRIPTION Rust preventer, oil-based emulsifier

SPECIFIC GRAVITY 0.91

FLASH POINT 310° F

REFERENCE (6)

Toxicity Tests:

Species			Ref.
Steelhead minnow fingerling	96 hr TL_m	22.5 mg/l	(6)

FASOLV

MANUFACTURER National Laboratories
225 Summit Avenue
Montvale, New Jersey 07645

Suggested for use at Santa Barbara, California

REFERENCE (25)

FINA SOL

MANUFACTURER Petrofina (Great Britain, Ltd.)
50 Rockefeller Plaza
New York, New York 10001

PRODUCT DESCRIPTION Nonionic

FINA TAR SOLVENT

MANUFACTURER Petrofina (Great Britain, Ltd.)

REFERENCE (4)(25)(26)

FINA TAR SOLVENT E.S.

MANUFACTURER Petrofina (Great Britain, Ltd.)

SPILL EXPERIENCE Used off Bizerta, Italy after tanker spill

REFERENCE (25)(30)

FINA-UNISOL

MANUFACTURER Petrofina (Great Britain, Ltd.)

PRODUCT DESCRIPTION Nonionic

SPILL EXPERIENCE Used during Torrey Canyon incident

REFERENCE (25)(26)(30)

F. O. 399

MANUFACTURER Fine Organics, Inc.
205 Main Street
Lodi, New Jersey 07644

PRODUCT DESCRIPTION Concentrated dispersant. A combination of surface active agents, solvents, emulsifiers, couplers and inhibitors.

APPLICATION METHOD Spray, holding end of nozzle close to the surface of the water, and at a tangent to get a good chopping action.

REFERENCE (25)

GREESKILLA 3

MANUFACTURER Atlas Preservative Co., Ltd.

REFERENCE (25)(26)

GULF AGENT 822

MANUFACTURER Gulf Research & Development Co.
P. O. Drawer 2038
Pittsburgh, Pennsylvania 15230

REFERENCE (26)

GULFSIL DE-GREASER

MANUFACTURER Gulf Oil (Great Britain, Ltd.)
6 Grosvenor Place
London, S.W.I., England

REFERENCE (11)

HAMCO

MANUFACTURER Hampton Road Chemical Corp.

REFERENCE (25)

HEPACOLITH

MANUFACTURER German Reference

REFERENCE (1)

HOUGHTOSAFE 112

MANUFACTURER Edgar Vaughan and Co., Ltd.
Legge Street
Birmingham 4, England

REFERENCE (4)(26)

HOUGHTOSOLV

MANUFACTURER Edgar Vaughan and Co., Ltd.

REFERENCE (11)

HOUGHTON-DETERGENT

MANUFACTURER Edgar Vaughan and Co., Ltd.

REFERENCE (30)

HYDRO-GAMOSOL

MANUFACTURER Gamlen Chemical Co.

REFERENCE (12)

Toxicity Tests:

Species		Ref.
Zebra fish (Brachydanio rerio)		
no survival	24 hrs @ 80 ppm	(12)

H-4000

MANUFACTURER Graphco, Inc.
Alamo, California 94507

PRODUCT DESCRIPTION Contains emulsifiers, detergents, wetting agents, naptha solvent, chlorinated hydrocarbons.

FLASH POINT 175° F (C.O.C.)

FIRE POINT 202° F (C.O.C.)

REFERENCE (25)

ICI SURFACTANT

MANUFACTURER I.C.I. America, Inc.

REFERENCE (26)

IMC-SWS

MANUFACTURER I.M.C. Drilling Mud, Inc.
P. O. Box 22605
Houston, Texas 77027

Suggested for use at Santa Barbara, California

REFERENCE (25)(26)

IGEPAL RC 520

MANUFACTURER	G.A.F. Corporation
PRODUCT DESCRIPTION	Nonionic
REFERENCE	(5)

JAY

PRODUCT DESCRIPTION	Anionic
REFERENCE	(25)

KLEARFAC AA040

MANUFACTURER	Wyandotte Chemicals Corp. Wyandotte, Michigan 48192
PRODUCT DESCRIPTION	Anionic - mono substituted orthos phosphate ester surfactant active agent, % by weig't (min.) 60%.
COST	30 - 40¢/lb. depending on quantity and grade(5)
SPECIFIC GRAVITY	1.112 @ 25° C/25° C
VISCOSITY	240 cps @ 25° C (Brookfield)
SOLUBILITY	Disperses in water
POUR POINT	55° F
USE LIMITATIONS	Dispersant to oil ratio 1:6 to 1:100 for crude oils(5)

KLEARFAC AA270

MANUFACTURER	Wyandotte Chemicals Corporation
PRODUCT DESCRIPTION	Anionic - mono substituted ortho phosphate ester surfactant active agent, % by weight (min.) 90%.
SPECIFIC GRAVITY	1.165 @ 25° C/25° C
VISCOSITY	5900 cps @ 25° C (Brookfield)
POUR POINT	25° F

KLEARFAC AA420

MANUFACTURER	Wyandotte Chemicals Corporation
PRODUCT DESCRIPTION	Anionic - mono substituted ortho phosphate ester surfactant agent, % by weight (min.) 90%.
SPECIFIC GRAVITY	1.118 @ 25° C/25° C
VISCOSITY	2950 cps @ 25° C (Brookfield)
POUR POINT	20° F

KLEARFAC AB 270

MANUFACTURER	Wyandotte Chemicals Corporation
PRODUCT DESCRIPTION	Anionic - mono substituted ortho phosphate ester surfactant active agent, % by weight (min.) 95%.
SPECIFIC GRAVITY	1.088 @ 25° C/25° C
VISCOSITY	800 cps @ 25° C (Brookfield)
POUR POINT	5° F

KELITE A-108-1

MANUFACTURER

Kelite Chemical Corp.
1250 North Main Street
Los Angeles, California 90052

Suggested for use at Santa Barbara, California

REFERENCE (25)

KILL-SPILL-D-166

MANUFACTURER Dunham Chemical Co.

PRODUCT DESCRIPTION Refer to Dunham D-166

KOR-14

MANUFACTURER Amalgamated Chemicals Corp.
P. O. Drawer 153
Orlando, Florida 32802

REFERENCE (25)

K-RITE 300

MANUFACTURER Winnie Engineering Corp.
Winnie, Texas 77665

PRODUCT DESCRIPTION A highly concentrated cold water emulsifier which will dissolve asphalt. Suggested for use at Santa Barbara, California.

REFERENCE (25)

KURI-CLEAN "SD"

Toxicity Tests:

Species		Ref.
Zebra fish (Brachydanio rerio)	None of 5 survived 24 hr @ 15 ppm	(12)

LIX 336

MANUFACTURER	The Lix Corporation 300 West 80 Street Kansas City, Missouri
COST	$0.80/gal (1-55 gal drum)
AVAILABILITY	F.O.B. Kansas City, Missouri
PRODUCT DESCRIPTION	A water-based cleaning compound. Contains tetra potassium pyro-phosphate, water, solvents, coupling and wetting agents.
SPECIFIC GRAVITY	1.02 @ 70° F
FLASH POINT	Does not burn
SHELF LIFE	Unlimited
OTHER	Store @ 32° F to 120° F

MANUFACTURER'S USE RECOMMENDATIONS:

Application Method	No experience
Dosage	Not known for oil spills
Use Limitations	Recommended for cleaning shore surfaces coated with Bunker C or distillate fuels. Applied diluted 4 times with water.

REFERENCE (14)

LIQUID CONCENTRATE
SWABY
ZIF

MANUFACTURER	Bestline Products, Inc. 1095 North Fifth Street San Jose, California 95112
	Suggested for use at Santa Barbara, California

REFERENCE (25)

LISSAPOL N. X.

MANUFACTURER — I.C.I. America, Inc.

PRODUCT DESCRIPTION — Nonionic, ethoxylated alkylphenol with 90% kerosene-naptha. Also referred to as anhydrous nonylphenol ethylenoide condensate.

REFERENCE — Time, 90, P. 68, July 1967.

MABEC-PP5
and
MABEC-21T

REFERENCE (25)

MAGNA

MANUFACTURER — Magna Corp.
1808 S. Bloomfield Avenue
Santa Fe Springs, California 90670

REFERENCE (25)

MAGNUS MARINE DISPERSER

MANUFACTURER — Magnus Chemical Co.

PRODUCT DESCRIPTION — Nonionic

EFFECTIVENESS — In lab test @ D/O ratio 1:1 emulsified 63.3% Navy Special Grade fuel oil.

SPECIFIC GRAVITY — 0.905 @ 80° F

POUR POINT — 6° F

FLASH POINT — 168° F (P.M.)

REFERENCE (16)

MARINE CLEANER 8551

MANUFACTURER	Enjay Chemical Co. 60 West 49 Street New York, New York 10020
PRODUCT DESCRIPTION	Water-based concentrate
SPECIFIC GRAVITY	1.05 @ 60° F
FLASH POINT	> 175° F (T.O.C.)
VISCOSITY	45 SSU @ 100° F 10 CS @ 32° F

Spill Experience:
Incident

"Esso Guildford", Casco Bay, Maine, August 9, 1969

Environmental Effects: Considerable quantities of seaweed were found dead or dying. Hard shell clams, mussels and barnacles were also found dead or dying. A kerosene odor was apparent in tidal pools and sand. Sand removed from a depth of 12" in a test pit had a strong kerosene odor. Tidal pools in and around the rocks on the shoreface were sterile and in some cases contained partially dispersed floating oil. Most of these had a detectable kerosene odor seven days after dispersant application.

MARINE CLEANER 8555

MANUFACTURER	Enjay Chemical Co.
PRODUCT DESCRIPTION	Blend of emulsifiers in a high-flash solvent
SPECIFIC GRAVITY	0.93 @ 60° F
FLASH POINT	> 175° F (T.O.C.)
VISCOSITY	33.1 SSU @ 100° F 6.2 CS @ 32° F 14.3 CS @ 0° F

For spill experience refer to Marine Cleaner 8551

REFERENCE (25)

MARITEC OIL SPILL REMOVER

MANUFACTURER Maritec Corp.

PRODUCT DESCRIPTION In lab test at D/O ratio of 1:1 emulsified 33.6% of Navy Special Grade fuel oil. Nonionic.

SPECIFIC GRAVITY 0.955 @ 80° F

POUR POINT - 44° F

FLASH POINT 190° F (C.O.C.)

REFERENCE (16)

METCLENE SPECIAL
METCLENE HEAVY DUTY DEGREASER
METSPERE HEAVY DUTY CLEANER

MANUFACTURER Metropolitan Petroleum Petrochemicals, Inc.
Jersey City, New Jersey 07303

REFERENCE (25)(26)

MIGHTY MATE

MANUFACTURER Sea Air Chemical Co.

Toxicity Tests:

Species		Ref.
Mummichog (*Fundulus heteroclitus*)	24 hr TL_m 320 mg/l 96 hr TL_m 300 mg/l	(13)

MILCHEN MIL-EMULSIFIER
MILCHEN PPS

MANUFACTURER Milchen, Inc.

REFERENCE (26)

MURCO-OSE #2

MANUFACTURER Murray Chemical Co., Inc.
The Whiteclean Corp.
235 East 31st Street
New York, New York 10001

PRODUCT DESCRIPTION Liquid emulsifier

REFERENCE (31)

MURATTI PRODUCT

Toxicity Tests:

Species			Ref.
Moharra (Eucinostomus argenteus)	6 hr TL_{100}	50 ppm	(20)
	18 hr TL_{43}	27 ppm	"
	24 hr TL_{85}	27 ppm	"
	24 hr TL_{25}	10 ppm	"

Tested in Puerto Rico at time of "Ocean Eagle" incident.

NAVEE 42

MANUFACTURER Amerace-Esna Corp.

PRODUCT DESCRIPTION A blend of solvents, soap, water and alkaline salts. The principal solvent is a high KB aromatic petroleum hydrocarbon; the soap is of the rosin tall oil type.

COSTS $1.80 - $2.55/gal

SPILL EXPERIENCE Anne Mildred Brøvig (Feb. 1966) in North Sea

Toxicity Tests:

Species			Ref.
Mummichog (Fundulus heteroclitus)	24 hr TL_m	175 mg/l	(13)
	96 hr TL_m	175 mg/l	

NAVITONE

MANUFACTURER Amerace-Esna Corp.

PRODUCT DESCRIPTION Contains emulsifiers, detergents and solvents.

REFERENCE (25)

NEOS AB

Toxicity Tests:

Species			Ref.
Zebra fish (Brachydanio rerio) 2 of 5 survived	24 hr	@ 20 ppm	(12)

NORSEMEN 67

MANUFACTURER	Norsemen Chemicals 68, Store Kongensgade D.K. 1264, Copenhagen Denmark
PRODUCT DESCRIPTION	A heavy duty oil degreaser. Nonionic in aromatic solvent.
SPECIFIC GRAVITY	0.89
FLASH POINT	63° C (PMCC)
VISCOSITY	1.60 cs @ 100° F
REFERENCE	(25)

NORSEMEN 69

MANUFACTURER	Norsemen Chemicals
PRODUCT DESCRIPTION	Sea cleaner. Nonionic solvent emulsifier
SPECIFIC GRAVITY	0.84
FLASH POINT	3.43 cs @ 100° F
DOSAGE	D/O ratio 1:5.5
REFERENCE	(25)

NYSTOL OIL SPILL EMULSIFIER #79

MANUFACTURER	Nystol Chemicals
	Conforms MIL-S-22864 (Amend. 2)
DOSAGE	1 gal/bbl-oil
REFERENCE	(31)

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OIL & GREASE REMOVER

MANUFACTURER	Germ .1 Reference
EFFECTIVENESS	In lab test @ D/O ratio 1:10 emuls.fied 82% of HD-SAE 20 motor oil.
REFERENCE (1)	

OIL & GREASE REMOVER

MANUFACTURER	E. F. Drew & Co. (now Drew Chemical Corp.)
EFFECTIVENESS	In lab test @ D/O ratio 1:1 emulsified 35.8% of Navy Special.
SPECIFIC GRAVITY	0.901 @ 80° F
POUR POINT	-26° F
FLASH POINT	164° F (P.M.)
REFERENCE (16)	

OIL AND SPILL ERADICATOR

MANUFACTURER	New Process Chemical Co. 350 Fifth Avenue New York, New York 10001
PRODUCT DESCRIPTION	Anionic.
EFFECTIVENESS	In lab test @ D/O ratio 1:1 emulsified 56% Navy Special.
SPECIFIC GRAVITY	0.891 @ 80° F
FLASH POINT	140° F (C.O.C.)
POUR POINT	-12° F
REFERENCE (16)	

OIL EX

MANUFACTURER — German Reference[1]

EFFECTIVENESS — At D/O ratio of 1:10 emulsified 52% of HD-SAE 20 motor oil.

OIL GO

MANUFACTURER — Casco Chemical Co.
R-88 High Street
Danvers, Massachusetts 01923

REFERENCE (26)

OIL MEGA

MANUFACTURER — Clarkson Laboratories

REFERENCE (25)

OIL SLICK EMULSIFIER #5189

EFFECTIVENESS — In lab test @ D/O ratio 1:1 emulsified 19.4% Navy Special grade fuel oil.

REFERENCE (9)

OIL SPILL

MANUFACTURER — Atlas Chemical Co.

REFERENCE (26)

OIL SPILL DISPERSER

MANUFACTURER May be Magnus Product

EFFECTIVENESS In lab test @ D/O ratio 1:1 emulsified 8.2% of Navy Special grade fuel oil.

REFERENCE (9)

OIL SPILL REMOVER #1

MANUFACTURER May be Gamlen Product

EFFECTIVENESS In lab test @ D/O ratio 1:1 emulsified 41.1% of Navy Special grade fuel oil.

REFERENCE (9)

OIL SPILL REMOVER #2

MANUFACTURER May be Gamlen Product

EFFECTIVENESS In lab test @ D/O ratio 1:1 emulsified 16.6% of Navy Special grade fuel oil.

REFERENCE (9)

OSR-7348

MANUFACTURER Crain Industrial Products Co.

FLASH POINT Non-flammable

Toxicity Tests:

Species			Ref.
Mummichog (*Fundulus heteroclitus*)	24 hr TL_m	100 mg/l	(13)
	96 hr TL_m	57 mg/l	"

PENETONE X 138

MANUFACTURER Amerace-Esna Corp.

Toxicity Tests:

Species				Ref.
Mummichog (Fundulus heteroclitus)	24 hr TL_m	26	mg/l	(13)
	96 hr TL_m	24.5	mg/l	"

PENTRON-D
*PENTRON TC-30

MANUFACTURER Technical Division
Apollo Chemical Co.
250 Delaware Avenue
Clifton, New Jersey 07014

REFERENCE (26)

*A marine tank cleaner

PERMAG #41

MANUFACTURER Magnuson Products Corp.
50 Court Street
Brooklyn, New York 11201

In lab test @ D/O ratio 1:1 - fair to poor results with Navy Special grade fuel oil.

REFERENCE (16)

PERO-KLEAN No. 801

MANUFACTURER The Perolin Co., Inc.
Empire State Building
New York, New York 10001

PRODUCT DESCRIPTION Marine cleaner. Heavy duty alkaline-solvent type product.

FLASH POINT 200° F (C.O.C.)

REFERENCE (16)

OXANE

MANUFACTURER Foreign Reference

REFERENCE (4)(26)

OXANEEZ

MANUFACTURER Nopco Chemical Co.
60 Park Place
Newark, New Jersey 07102

REFERENCE (5)(26)

PARDAG HEAVY DUTY

REFERENCE (25)(26)

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*PC-65 SUPERSLICK
PC-5
PC-6
PC-17
PC-50

MANUFACTURER White Chemicals Division
White Manufacturing Co.
1140 Lockwood Drive
Houston, Texas 77020

REFERENCE (26)

*PC-65 Superslick. Nonsolvent. $2.75/gal. Diluted 1 to 10 times with water. Reference (25)(26).

PENETONE 867(16)

MANUFACTURER Amerace-Esna Corp.

Contains 68% water.

EFFECTIVENESS In lab test @ D/O ratio 1:1 emulsified 11.5% Navy Special Grade fuel oil.

PERO-KLEAN No. 805

MANUFACTURER	The Perolin Co., Inc.
EFFECTIVENESS	In lab test @ D/O ratio 1:1, emulsified 14.3% of Navy Special grade fuel oil.

REFERENCE (16)

NOTE: Other Perolin Products: No. 802, Powder surfactant
No. 842, Liquid Alkaline Cleaner

PERO-Klean No. 818

MANUFACTURER	The Perolin Co., Inc.
PRODUCT DESCRIPTION	Nonionic - aromatic solvent emulsifier
COST	$3.10 - $3.50/gal.
AVAILABILITY	Worldwide
FLASH POINT	200° F
VISCOSITY	ca 180° F
pH	7
APPLICATION METHOD	Spray undiluted
HUMAN HAZARD	Avoid eye or skin contact
EFFECTIVENESS	One of the most effective of 5 products tested at dispersant to oil ratio 1:5 to 1:10 — most effective on fuel oils, Saskatchewan and Silurian crudes and least effective on Alberta, Leduc and Cambrion Crudes[17].
	At 1:10 D/O ratio Pero-Klean No. 818 emulsified 58% of HD-SAE 20 motor oil[1].

Toxicity Tests:

Species		Ref.
Fathead minnow (Pimephales promelas) (Most toxic of 5 dispersants tested)	96 hr TL_m 53 ppm	(17)

Imparts very intense odor to water. Threshold odor number at 1 ppm is > 200.

REFERENCE (17)

PETRO-BAN

MANUFACTURER	Napasco Chemical Co. P. O. Box 10532 New Orleans, Louisiana 70113
PRODUCT DESCRIPTION	Oil spill remover. Solvent detergent emulsifier. Forms milky emulsion in water.
SPECIFIC GRAVITY	0.92 @ 60° F
FLASH POINT	155° F (C.O.C.)
VISCOSITY	43 SSU @ 100° F
FIRE POINT	160° F (C.O.C.)
REFERENCE	(25)

PILOT OIL SPILL ERADICATOR

MANUFACTURER	Pilot Chemical Co. P. O. Box 12292 Norfolk, Virginia 23502
	In lab test @ D/O ratio 1:1 emulsified 78.9% of Navy Special grade fuel oil[9].
REFERENCE	(9)(26)

P.O. 576

MANUFACTURER	Clarkson Laboratories
EFFECTIVENESS	In lab test @ D/O ratio 1:1 emulsified 16.7% of Navy Special grade fuel oil.
REFERENCE	(16)

POLY-ZYME

MANUFACTURER	Zurn Industries, Inc. 1801 Pittsburg Avenue Erie, Pennsylvania 16512
REFERENCE	(27)

PRODUCT 20215

MANUFACTURER Unknown

Toxicity Tests:

Species			Ref.
Moharra (Eucinostomus argenteus)	6-12 hr TI_{29}	20 ppm	(20)
	18-24 hr TL_{57}	20 ppm	"

Remarks: Tested in Puerto Rico at time of "Ocean Eagle" incident.

RETZLOFF 1-4016-P

MANUFACTURER Retzloff Chemical Co.
Houston, Texas 77002

PRODUCT DESCRIPTION Contains diesel fuel solvent

FLASH POINT 150° F (min.)

REFERENCE (25)(26)

S-1

MANUFACTURER Coastal Services, Inc.
343 Washington Square
Braintree, Massachusetts 02184

PRODUCT DESCRIPTION Same as Colloid 88. Also called Coastal Services 88.

REFERENCE (25)

S-5

MANUFACTURER Coastal Services, Inc.

PRODUCT DESCRIPTION A solvent based Colloid product.

REFERENCE (25)

SEA CLEAN 70

MANUFACTURER The Perolin Co., Inc.

REFERENCE (12)

Toxicity Tests:

Species		Ref.
Zebra fish (Brachydanio rerio)	No survival 24 hrs @ 20 ppm	(12)

SEA GREEN 50 A
SEA GREEN 70

MANUFACTURER Sea Light Mfg. Co., Ltd.
6th Floor, Kyoda Bldg. No. 1
1 Chrome
Hancho Nihon Basli Chou Ku
Tokyo, Japan

REFERENCE (10)(26)

SEA SWEEP

MANUFACTURER Eureka Chemical Co.
P. O. Box 1608
Olympia, Washington 98501

EFFECTIVENESS On a scale of 1 (high) to 4 (low) was given a rating of 1. Was one of most effective of 11 products tested(6).

Toxicity Tests:

Species			
Pacific oyster larvae (Crassotrea gigas)	Toxic	1.5 ppm	(6)
	Non-toxic	0.8 ppm	(")

SANTOMERSE ME-B
SLURRY

MANUFACTURER — Monsanto
Inorganic Chemicals Division
800 North Lindbergh Boulevard
St. Louis, Missouri 63166

REFERENCE (26)

SELF-RINSE

MANUFACTURER — New Process Chemical Co.

In lab test @ D/O ratio 1:1 emulsified 7.0% of Navy Special grade fuel oil.

FLASH POINT — 198° F (P.M.)

REFERENCE (16)

SEPTEX

MANUFACTURER — The Chemlan Co.

PRODUCT DESCRIPTION — Contains emulsifiers, penetrants and deodorizers. Primarily for opening clogged septic tank and cesspool lines.

REFERENCE (25)(26)

SHIP CLEAN

MANUFACTURER — Amerace-Esna Corp.

REFERENCE (25)

SILLARIT

MANUFACTURER — German Reference[1]

At D/O ratio of 1:10 emulsified 52% of HD-SAE motor oil.

SKANEX QUICK
SKANEX S EMULSIFIER

MANUFACTURER Scandinavian Oil Service

REFERENCE (26)

SLICKAWAY

MANUFACTURER Mankana Chemical Co.
2324 Boston Street
Baltimore, Maryland 21224

REFERENCE (26)

SLIPCLEAN

MANUFACTURER Slip Trading Co.
34 Great St. Helen's Street
London, E.C. 3, England

PRODUCT DESCRIPTION Referred to as a rigwash detergent

REFERENCE (4)(11)(26)

(Dasic) SLICKGONE I

MANUFACTURER — Dasic Chemicals Ltd.
Winchester Road
Romsey, Hampshire, England

PRODUCT DESCRIPTION — Nonionic detergent

REFERENCE (4)

Spill Experience:
Incident

Torrey Canyon, March 1967. Effectiveness not determined.

Toxicity Tests:

Species			Ref.
Pink shrimp (Pandalus montagui)	48 hr TL_m	5.2 ppm	(3)
Brown shrimp (Crangon crangon)	48 hr TL_m	6.6 ppm	"
Shore crab (Carcinus maenas)	48 hr TL_m	35 ppm	"
Cockles (Cardium edule)	48 hr TL_m	32.4 ppm	"

SLICKGONE #2

MANUFACTURER — Dasic Chemicals Ltd.

PRODUCT DESCRIPTION — Nonionic detergent[4] solvent based

COST — $2.30/gal.[26]

DOSAGE — Dispersant to oil ratio 1:10 by volume

Toxicity Tests:

Species			Ref.
Pink shrimp (Pandalus montagui)	48 hr TL_m	4.5 ppm	(3)
Brown shrimp (Crangon crangon)	48 hr TL_m	3.5 ppm	"
Shore crabs (Carcinus maenas)	48 hr TL_m	21.3 ppm	"
Cockles (Cardium edule)	48 hr TL_m	30.5 ppm	"
Zebra fish (Brachydanio rerio) No survival	24 hr	25 ppm	"

SNOWDRIFT

MANUFACTURER Monsanto Inorganic Chemical Div.

PRODUCT DESCRIPTION Referred to as a beach cleaner

REFERENCE (4)

SP 162

MANUFACTURER B. P. Ltd.

REFERENCE (26)

STREP 33

MANUFACTURER W. and F. Walker Ltd.
Kirby, Liverpool
England

STRUKTOL

MANUFACTURER German Reference(1)

At D/O ratio of 1:10 emulsified 86% of HD-SAE 20 Motor Oil.

SURFACTANT 8651

MANUFACTURER Enjay Chemical Company

Toxicity Tests:

Species		Ref.
Zebra fish (Brachydanio rerio) None Survived	24 hrs @ 10 ppm	(12)

SURFEMUL #5

MANUFACTURER 3 C Chemical Corp.

REFERENCE (18)(26)

Toxicity Tests:

Species		Ref.
Fundulus parvepinnis	24 hr TL_m 350 ppm 96 hr TL_m 350 ppm	(18)

TANK-GLO

MANUFACTURER Sea Air Chemical Co.

PRODUCT DESCRIPTION Nonionic -70% water.

EFFECTIVENESS In lab test @ D/O ratio 1:1 emulsified 25.2% of Navy Special Grade fuel oil.

SPECIFIC GRAVITY 1.075 @ 80° F

REFERENCE (16)

TCC-569 (Crain)

MANUFACTURER Crain Industrial Products Corp.

TEEPOL

PRODUCT DESCRIPTION Referred to as anionic detergent

REFERENCE (4)(30)

TERGITOL 15-S-5

MANUFACTURER Union Carbide Chemical Corp.

PRODUCT DESCRIPTION Nonionic

Toxicity Tests:

Species			Ref.
Mummichog (Fundulus heteroclitus)	24 hr TL_m	3.8 mg/l	(13)
	96 hr TL_m	3.8 mg/l	"

TERGITOL 15-S-9

MANUFACTURER Union Carbide Chemical Corp.

PRODUCT DESCRIPTION Nonionic

Toxicity Tests:

Species			Ref.
Mummichog (Fundulus heteroclitus)	24 hr TL_m	9.0 mg/l	(13)
	96 hr TL_m	7.8 mg/l	"

TIP TOP CLEANER

MANUFACTURER Dutch Pride Products
San Jose, California 95125

Suggested for use at Santa Barbara, California

REFERENCE (25)

TRACER-TECK

PRODUCT DESCRIPTION Nonionic

REFERENCE (25)

TRET-O-LITE E3453

MANUFACTURER Petrolite Corp.

REFERENCE (26)

TRICON

MANUFACTURER New Process Chemical Co.

PRODUCT DESCRIPTION Oil and spill eradicator (no longer available). Anionic. 10% polyethylene glycol ether; 5% fatty acids; 2% alcohol; 63% petroleum solvents; 20% petroleum sulfonate.

SPECIFIC GRAVITY 0.891 @ 80°F

FLASH POINT 140°F (C.O.C.)

OTHER Pour Point - 12°F

EFFECTIVENESS At 1:1 ratio emulsified 66.6% of Navy Special Grade fuel oil(10).

Toxicity Tests:

Species		Ref.
Striped bass	Toxic at low concentrations	(7)

TURC

REFERENCE (25)

(TWELVE) 12 N DEGREASER

MANUFACTURER Timmons and Charles
110 Academy Street
Jersey City, New Jersey 07303

APPLICATION Spray @ D/O ratio 1:1

SPECIFIC GRAVITY 0.925

FLASH POINT 190°F

pH 6.6-6.8

REFERENCE (25)

UNICO CONCENTRATE

MANUFACTURER Universal Supply Co.

PRODUCT DESCRIPTION Concentrate. Nonionic, traces cationic.

REFERENCE (25)(26)(29)

Toxicity Tests:

Species		Ref.
Fundulus parvipinnis	24 hr TL_m 220 ppm	(18)
	96 hr TL_m 220 ppm	"

UNISOL-FE

MANUFACTURER May be Universal Supply Co.

REFERENCE (12)

Toxicity Tests:

Species		Ref.
Zebra fish (Brachydanio rerio)		
	No survival 24 hr @ 20 ppm	(12)

VECOM B-24

MANUFACTURER — German Reference (1)

EFFECTIVENESS — At D/O ratio 1:10 emulsivied 50% of HD-SAE motor oil.

VISCO C-16-F

MANUFACTURER — Nalco Chemical Co.
Box 87
Sugar Land, Texas 77478

REFERENCE (26)

WEN-DON FORMULA 203

MANUFACTURER — Wen-Don Chemical Co.

REFERENCE (25)

WHITTAKERS G.P. DEGREASANT

MANUFACTURER — English Reference

REFERENCE (4)(26)

WYANDOTTE 20

MANUFACTURER — Wyandotte Chemical Corp.

Discontinued product used during "Ocean Eagle" incident, San Juan, Puerto Rico.

REFERENCE (25)

MANUFACTURER AND PRODUCT INDEX

Manufacturer	Products	Section
Adair Equipment Co. 405 Century Building Houston, Texas 77002	Cold Clean	B
Aetna Chemical Corp. Power Division East Paterson, New Jersey 07407	Actemul Actemul U.C.	B B
Alex C. Ferguson Co., Inc. Philadelphia, Pennsylvania 19104	AFCO #5350	B
Alken-Murray Corporation 111 Fifth Avenue New York, New York 10003	Alken O.S.D.	A
Amalgamated Chemicals Corp. P.O. Drawer 153 Orlando, Florida 32802	Kor-14	B
Amerace-Esna Corp. Chemical Specialties Division 74 Hudson Avenue Tenafly, New Jersey 07670	Slix Navce 42 Navitone Penetone 867 Penetone X138 Ship Clean	A B B B B B
Amway Corporation Ada, Michigan 49301	Amway Industroclean	B
Apollo Chemical Co. Technical Division 250 Delaware Avenue Clifton, New Jersey 07014	Pentron-D Pentron TC-30	B B
Ara Chem, Inc. P.O. Box 5031 San Diego, California 92105	Gold Crew Dispersant	A
Ashland Chemicals 8 East Long Street Columbus, Ohio 43216	Ridzlik	A
Atlas Chemical Industries, Inc. 1270 Avenue of the Americas New York, New York 10020	Cronax (Oil Spill) Oil Spill	B B
Atlas Preservative Co., Ltd. Fraser Road	Atlas 1901 Greeskilla 3	P P

Manufacturer	Products	Section
Banner Chemical Products Corp. 46 Great Jones New York, New York 10001	D. G. 04	B
B&B Chemical Co., Inc. Box 796 Miami, Florida 33166	B&B 2021-S B&B 2023	A A
Bergen Chemical Corp. Back Bay P.O. Box 371 Boston, Massachusetts 02117	Bergen Oil on Water Remover	B
The Besco Corporation 200 N. Myrtle Street Metairie, Louisiana 70004	Besco B-51 DT Besco D-Emulsion No. 100 Besco Slick - 440	A A A
Bestline Products, Inc. 1095 North Fifth Street San Jose, California 95112	Liquid Concentrate Swaby Zif	B B B
BP North America, Inc. 620 Fifth Avenue New York, New York 10020	BP-1002 BP-1100 SP-162	A A B
Carter Chemical Co. 250 Fulton Avenue Hempstead, New York 11550	Aquatreat	B
Casco Chemical Co. R-88 High Street Danvers, Massachusetts 01923	Oil Go	B
Cejer Co. 2545 Treedy Boulevard South Gate, California 90280	Cejer APC	B
The Chemlan Co. 24 Smith Street Biddleford, Maine 04005	Degreaser 80 G Septex	B B
Chevron Chemical Co. 200 Bush Street San Francisco, California 94101	Chevron NI-O	B
The Clarkson Laboratories 1450 Ferry Avenue Camden, New Jersey 08104	Blitz Oil Mega P.O. 576	A B B

Manufacturer	Products	Section
Cleaning Compounds Corp. 999 Commercial Street Palo Alto, California 94302	Clock 06:39	B
Coastal Services, Inc. 343 Washington Square Braintree, Massachusetts 02184	S-1 S-5	B B
Colloid Chemical Co. 31 Perkins Street Brockton, Massachusetts 02402	Colloid-88	A
Continental Chemical Co. 270 Clifton Boulevard Clifton, New Jersey 07015	Conco Emulsifier 700 Conco Emulsifier K Con-O-1571	B B B
Crain Inudstrial Products Corp. P.O. Box 34233 Farmers Branch, Texas 75234 also P.O. Box 1062 2411 Swiss Avenue Dallas, Texas 75221	LCP-12 OD-2 OSR-7348 TCC-569	A A B B
Cultured Chemical Division 1139 West Struck Avenue Orange, California 92667	DBC Plus	B
Dasic Chemicals Ltd. Winchester Road Romsey, Hampshire, England	Slickgone #1 Slickgone #2	B B
Diversified Chemicals Corp. 8100 Electric Avenue Stanton, California 90680	Di-Chem 320 Di-Chem 322 Di-Chem 325 Di-Chem 400	A B B B
Drew Chemical Corp. 522 Fifth Avenue New York, New York 10036	Ameroid Oil Spill Emulsifier #1 Ameroid Drewclean 522 Drew SL 96 Drew Tank Cleaner #4 Oil and Grease Remover	A B B B B
Dunham Chemical Co. 20 Versey Street New York, New York 10001	Dunham D-166	B

Manufacturer	Products	Section
Dutch Pride Products San Jose, California 95125	Tip Top Cleaner	B
Edgar Vaughan and Co., Ltd. Legge Street Birmingham 4, England	Houghtosafe 112 Houghtosolv Houghton-Detergent	B B B
Enjay Chemical Co. 60 West 49th Street New York, New York 10020	Corexit 7664 Corexit 8666 Cleaner 8671 COE Marine Cleaner 8551 Marine Cleaner 8555 Surfactant 8651	A A B B B B B
Esso Research & Engineering Linden, New Jersey 07036	Esso F-6155	B
Eureka Chemical Co. P.O. Box 1608 Olympia, Washington 98501	Sea Sweep	B
Fine Organics, Inc. 205 Main Street Lodi, New Jersey 07644	F.O. 300-B F.O. 300-H F.O. 399	A A B
GAF Corporation 140 West 51st Street New York, New York 10020	Igepal Co-430 Igepal Co-530 Igepal Rc-520	A A B
Gamlen Chemical Co. 321 Victory Avenue So. San Francisco, California 94080	Gamlen D Solvent Gamosol Oil Spill Remover GW Solvent Hydro-Gamosol	A A B B
Graphco, Inc. Alamo, California 94507	H-4000	B
Guardian Chemical Corp. 41-45 Crescent Street Long Island City, New York 11101	Polycomplex A-11 Polycomplex A-11 D	A A
Gulf Oil (Great Britain, Ltd.) 6 Grosvenor Place London, S.W.I., England	Gulfsil De-Greaser	B
Gulf Research & Development Co. P.O. Drawer 2038 Pittsburgh, Pennsylvania 15230	Gulf Agent 822	B

Manufacturer	Products	Section
Hampton Roads Chemical Corp. P.O. Box 1848 Newport News, Virginia 23607	Degreco	B
Hemisphere Marine Chemicals Co., Inc. 300 Main Street Orange, New Jersey 07050	Hemco No. 2	A
Holl-Chem, Inc. 502-A Maritime Building Seattle, Washington 98104	Holl-Chem #622	A
ICI America, Inc. 151 South Street Stamford, Connecticut 06904	Dispersol OS Cirrasol ICI Surfactant Lissapol N.X.	A B B B
I.M.C. Drilling Mud, Inc. P.O. Box 22605 Houston, Texas 77027	IMC-SWS	B
Johnson-March Corporation 3rd and Berks Street Philadelphia, Pennsylvania 19122	Isomal 265	A
Kelite Chemical Corp. 1250 North Main Street Los Angeles, California 90052	Kelite A-108-1	B
Lawton Specialty Co., Inc. P.O. Box 44 Lawton, Oklahoma 73501	Magic Power Oil Dispersent OD #1	A
The Lix Corporation 300 West 80th Street Kansas City, Missouri 64114	Lix 336	B
Magna Corporation 1808 S. Bloomfield Avenue Santa Fe Springs, California 90670	Magna	B
Magnus Chemical Co. 400 South Avenue Garwood, New Jersey 07627	Magnus Oil Spill Disperser Automatic Tank Wash Magnus Marine Disperser	A B B
Magnuson Products Corp. 50 Court Street Brooklyn, New York 11201	Permag #41	B

Manufacturer	Products	Section
Mankana Chemical Co. 2324 Boston Street Baltimore, Maryland 21224	Slickaway	B
Maritec Corp.	Maritec Oil Spill Remover	B
Metropolitan Petroleum Petrochemicals, Inc. 24 Caven Point Road Jersey City, New Jersey 07304	Met Aquaclene 100	A
	Metclene Special	B
	Metclene Heavy Duty Degreaser	B
	Metspere Heavy Duty Cleaner	B
Milchen, Inc. Box 2211 Houston, Texas 77001	Aquanix	B
	Milchen Mil-Emulsifier	B
	Milchen PPS	B
Monsanto Inorganic Chemicals Division 800 North Lindbergh Boulevard St. Louis, Missouri 63166	Santomerse MB-B	B
	Slurry	B
	Snowdrift	B
Montgomery Chemical Company P.O. Box 187 Jenkintown, Pennsylvania 19046	Aquanex MC	A
Murray Chemical Co., Inc. The Whiteclean Corp. 235 East 31st Street New York, New York 10001	Murco-Ose #2	B
Nalco Chemical Co. Box 87 Sugar Land, Texas 77478	Visco C-16-F	B
Napasco Chemical Co. P.O. Box 10532 New Orleans, Louisiana 70113	Petro-Ban	B
Norsemen Chemicals 68, Store Kongensgade D.K. 1264, Copenhagen Denmark	Norsemen 67	B
	Norsemen 69	B
National Laboratories 225 Summit Avenue Montvale, New Jersey 07645	Fasolv	B

Manufacturer	Products	Section
National Lead Company Baroid Division P.O. Box 1675 Houston, Texas 77002	Surflo RD 282 Baroid Slix-5 Degreaser	A B
National Research and Chemical Company 1250 Cerise Avenue Hawthorne, California 90250 also 30 East 42nd Street New York, New York 10001	Tyfosol 80	A
Navada Enzymes, Inc. 3049 Riegel, Building C Las Vegas, Nevada 89012	Bacto-Zyme	A
New Process Chemical Co. 350 Fifth Avenue New York, New York 10001	Oil & Spill Eradicator Self Rinse Tricon	B B B
Nopco Chemical Co. 60 Park Place Newark, New Jersey 07102	Oxaneez	B
Nystol Chemicals	Nystol Oil Spill Emulsifier #79	B
O'Brien Industries, Inc. 1040 Bushwick Avenue Brooklyn, New York 11201	Disperite 110	B
Pacific Chemical 4501 Shilshole N.W. Seattle, Washington 98107	Spill-X	A
Pepper Tank Cleaning Co. 2000 McKinley Avenue National City, California 92050	Disperse-Oil	A
The Perolin Co., Inc. Empire State Building New York, New York 10001	Pero-Klean No. 801 Pero-Klean No. 805 Pero-Klean No. 818 Sea Clean 70	B B B B
Petrofina (Great Britain, Ltd.) 50 Rockefeller Plaza New York, New York 10001	Fina Sol Fina Tar Solvent Fina Tar Solvent E.S. Fina-Unisol	B B B B

Manufacturer	Products	Section
Petrolite Corporation Tretolite Division 369 Marshall Avenue St. Louis, Missouri 63119 also 2 West 4th Street New York, New York 10017	Petrolite W-1439 Petrolite W-30 Tret-O-Lite	A A B
Pilot Chemical Co. P.O. Box 12292 Norfolk, Virginia 23502	Pilot Oil Spill Eradicator	B
Polycell Products, Ltd. Broadwater Road Welwyn Garden City Hertsfordshire, United Kingdom	Polyclens (Moltoklar)	A
Retzloff Chemical Co. Houston, Texas 77002	Retzloff 1-4016-P	B
Richardson Company 100 New Street Paterson, New Jersey 07510	Compound Richonage YLA	B
Rohm & Haas Company Independence Mall West Philadelphia, Pennsylvania 19105	BD-30	B
Scandinavian Oil Service Stora Badhusgatan 20 S-41121 Gothenburg, Sweden Domestic Representative: Surface Separator Systems, Inc. 103 Mellor Avenue Baltimore, Maryland 21228	Skanex S-102 Skanex Qucik	A B
Sea-Air Chemical Corp. 32-00 Borden Avenue Long Island City, New York 11106	Foilzoil Dact Deck Glo Dispersal Dissolvol Dissolvo Mighty Mate Tank Glo	A B B B B B B B

Manufacturer	Products	Section
Sea Light Mfg. Co., Ltd. 6th Floor, Kyoda Bldg. No. 1 1 Chrome Hancho Nihon Basli Chou Ku Tokyo, Japan	Sea Green 50 A Sea Green 70	B B
Shaklee Products Hayward, California 94544	Basic-H	B
Slip Trading Company 34 Great St. Helen's Street London, E.C. 3, England	Slipclean	B
Sunshine Chemical Corp. P.O. Box 2041 West Hartford, Connecticut 06117 also P.O. Box 5534 Jacksonville, Florida 32207	Jansolv-60 Jansolv-60 W	A A
Teoc, Inc. P.O. Box 513 1100 Victory Drive Westwago, Louisiana 70094	Teoc 444 Teoc 777	A A
Texas Refinery Corp. Fort Worth, Texas 76101	Big Red	B
3 C Chemical Corp.	Surfemul #5	B
Timmons and Charles 110 Academy Street Jersey City, New Jersey 07303	(Twelve) 12 N Degreaser	B
Turco Chemische Producten N.V. Verl. Blokkenweg 12 Ede, Holland	Seamulso E	A
Union Carbide Chemical Corp. 270 Park Avenue New York, New York 10001	Tergitol 15-S-5 Tergitol 15-S-9	B B
Universal Supply Company	Unico Concentrate	B
W. and F. Walker Ltd. Kirby, Liverpool England	Strep 33	B
Wen-Don Chemical Co.	Wen-Don Formula 203	B

Manufacturer	Products	Section
White Chemicals Division White Manufacturing Company 1140 Lockwood Drive Houston, Texas 77020	PC-65 Superslick	B
	PC-5	B
	PC-6	B
	PC-17	B
	PC-50	B
Winnie Engineering Corp. Winnie, Texas 77665	K-Rite 300	B
W. R. Grace & Co. Du Bois Chemical Division Union Avenue & Du Bois East Rutherford, New Jersey 07070	Actusol	B
	Actusol T-776	B
	Emsol	B
	E-314	B
Wyandotte Chemicals Corp. J. B. Ford Division Wyandotte, Michigan 48192	Casol	A
	Talent	A
	Spill Remover	A
	Klearfac AA040	B
	Klearfac AA270	B
	Klearfac AA420	B
	Klearfac AB270	B
	Wyandotte 20	B
Xzit Chemical Company 56 Newark Street Hoboken, New Jersey 07030	Oil Spill Eradicator X-1-11	A
Zurn Industries, Inc. 1801 Pittsburg Avenue Erie, Pennsylvania 16512	Poly-Zyme	B

REFERENCES

1. Hellman, H. and Knopp, H., Further investigation into the suitability of EMULSIFIERS FOR THE ELIMINATION OF OIL FROM SURFACE WATERS, Deutsche Gewasserkunkl Mitteilung, 11, 4, 91

2. Poliakoff, M. Z. (1969) OIL DISPERSING CHEMICALS, EPA, WQO, Edison Water Quality Laboratory, Edison, New Jersey.

3. Portmann, J. E. and Connor, P. M. (1968), THE TOXICITY OF SEVERAL OIL-SPILL REMOVERS TO SOME SPECIES OF FISH AND SHELL-FISH, Marine Biology, International Journal on Life in Oceans and Coastal Waters, 1, 4, p. 322-329.

4. Smith, J. E. (Edit.) (1968), TORREY CANYON POLLUTION AND MARINE LIFE, Cambridge University Press, New York City.

5. COMBATING POLLUTION CREATED BY OIL SPILLS, VOLUME 1, METHODS (1970), A. D. Little, Inc. (Report to Dept. of Transportation, U. S. Coast Guard).

6. Tracy, H. B., Lee, R. A., Woelke, C. E., and Sanborn, K. (1969) A REPORT ON THE RELATIVE TOXICITIES AND DISPERSING-EVALUATIONS OF ELEVEN OIL-DISPERSING PRODUCTS, State of Washington, Water Pollution Control Commission and Department of Fisheries.

7. Chadwick, H. K. (1969), TOXICITY OF TRICON OIL SPILL ERADICATOR TO STRIPED BASS, California Fish and Game, 46, 3, 371

8. REPORT OF EXPERIENCE OF THE GERMAN MARITIME TRAFFIC ADMINISTRATION on the sea accident of the Norwegian tanker "Anne Mildred Brøvig" occurred on February 20, 1966 in the North Sea.

9. Culbertson, T. L., and Scott, A. L. (1968), CHEMICAL TREATMENT OF OIL SPILLED ON HARBOR WATERS, Technical Note N-983, Naval Civil Engineering Laboratory, Port Hueneme, California.

10. STUDY OF EQUIPMENT AND METHODS FOR REMOVING OIL FROM HARBOR WATERS (1969), Battelle Memorial Institute, Pacific Northwest Laboratories, Appendix B, II. Chemical Agents (Report for Department of Navy, Naval Civil Engineering Laboratory).

11. Taylor, J. C. (1962), THE RECOVERY AND CONTAINING OF OIL SPILLS, Journal of the Institute of Petroleum, 18, 447, 355.

12. Unpublished results, Humble Oil Company (1969).

13. Unpublished results, FWQA (1969)

14. OIL SPILL TREATING AGENTS - A COMPENDIUM (1970), Battelle Memorial Institute, Pacific Northwest Laboratories (Report for American Petroleum Institute).

15. Zillich, J. (1969), A BIOLOGICAL EVALUATION OF SIX CHEMICALS USED TO DISPERSE OIL SPILLS, State of Michigan, Dept. of Natural Resources.

16. Rozene, B. B., Zaccaria, L. V. (1961), DEVELOPMENT OF PROPOSED SPECIFICATION FOR OIL SLICK SOLVENT EMULSIFIER, Report No. 951-61, Boston Naval Shipyard, U. S. Navy.

17. Oda, A. (1968), A REPORT ON THE LABORATORY EVALUATION OF FIVE CHEMICAL ADDITIVES USED FOR THE REMOVAL OF OIL SLICKS ON WATER, Ontario Water Resources Commission, Toronto.

18. RESULTS OF A BIOASSAY FOR UNION OIL CO. (1969), Agri Science Laboratories, Inc., Hawthorne, California.

19. Dowden, B. F., (1962), TOXICITY OF COMMERICAL WASTE-OIL EMULSIFIERS TO DAPHNIA MAGNA, Jour. WPCF, 34, 10, 1010.

20. Eger, W. F. (1968), RESUME OF ACTIVITIES REGARDING OCEAN EAGLE, University of Puerto Rico, Department of Marine Sciences, Mayaguez, P. R.

21. Johnson, R. F. (1967), Final report on A BIOLOGICAL ASSAY FOR POSSIBLE EFFECTS OF POLYCOMPLEX A ON MARINE FISH AND SHELLFISH to Guardian Chemical Corporation, William F. Clapp Laboratories, Inc. of Battelle Memorial Institute Report #13757.

22. Unpublished New York State Conservation Department (1968).

23. Canevari, G. P. (1970) Corexit 7664 OIL DISPERSANT STATUS OF TOXICITY EVALUATIONS, Esso Research and Engineering Company, Florham Park, New Jersey.

24. Canevari, G. P. (1970) Corexi 8666 OIL DISPERSANT STATUS OF TOXICITY EVALUATIONS, Esso Research and Engineering Company, Florham Park, New Jersey.

25. Oil Spill Product Files FWQA, Edison, New Jersey.

26. SYSTEMS STUDY OF OIL SPILL CLEANING PROCEDURES VOLUME 1: ANALYSIS OF OIL SPILLS AND CONTROL MATERIALS (1970), Dillingham Corp., LaJolla, California (Final report to American Petroleum Institute).

27. Tobin, P. M. (1970), USE OF DISPERSANT, AQUACLENE 100, AT THE GULF OIL COMPANY OIL SPILL IN PHILADELPHIA, PENNSYLVANIA, Unpublished trip report, FWQA, Edison, New Jersey.

28. CONTINGENCY PLANS FOR SPILLS OF OIL AND OTHER HAZARDOUS MATERIALS IN NEW ENGLAND (1969), U.S. Dept. of the Interior, FWPCA, New England Basins Office, Needham Heights, Massachusetts.

29. Merrell, J. C. (1969), PRELIMINARY DISPERSANT EVALUATIONS, Unpublished Memo, Santa Barbara Sub-Office, FWQA.

30. Carthy, J. P. and Arthur, D. R. (Editors) (1968), THE BIOLOGICAL EFFECTS OF OIL POLLUTION ON LITTORAL COMMUNITIES, Supplement to Volume 2 of Field Studies, Field Studies Council, London.

31. LITERATURE ON OIL SPILL CONTROL, Marine West, Sept. - Oct. (1968), p. 15.

32. Stander, G. H., THE ESSO ESSEN INCIDENT, South African Shipping News and Fishing Industry Review, August 1968, p. 41.

33. USE OF CHEMICALS, MATERIALS OR TECHNIQUES TO TREAT OIL SPILLS (1970) Publication No. 5394, Commonwealth of Massachusetts, Division of Water Pollution Control, Boston, Massachusetts.

34. Mills, E. R., Jr. (1970), THE ACUTE TOXICITY OF VARIOUS CRUDE OILS AND OIL SPILL REMOVERS ON TWO GENERA OF MARINE SHRIMP, M. S. Thesis, Louisiana State University.

35. Unpublished (1968), Dept. of the Interior, Bureau of Commerical Fisheries, La Jolla, California.